Serial Dept.

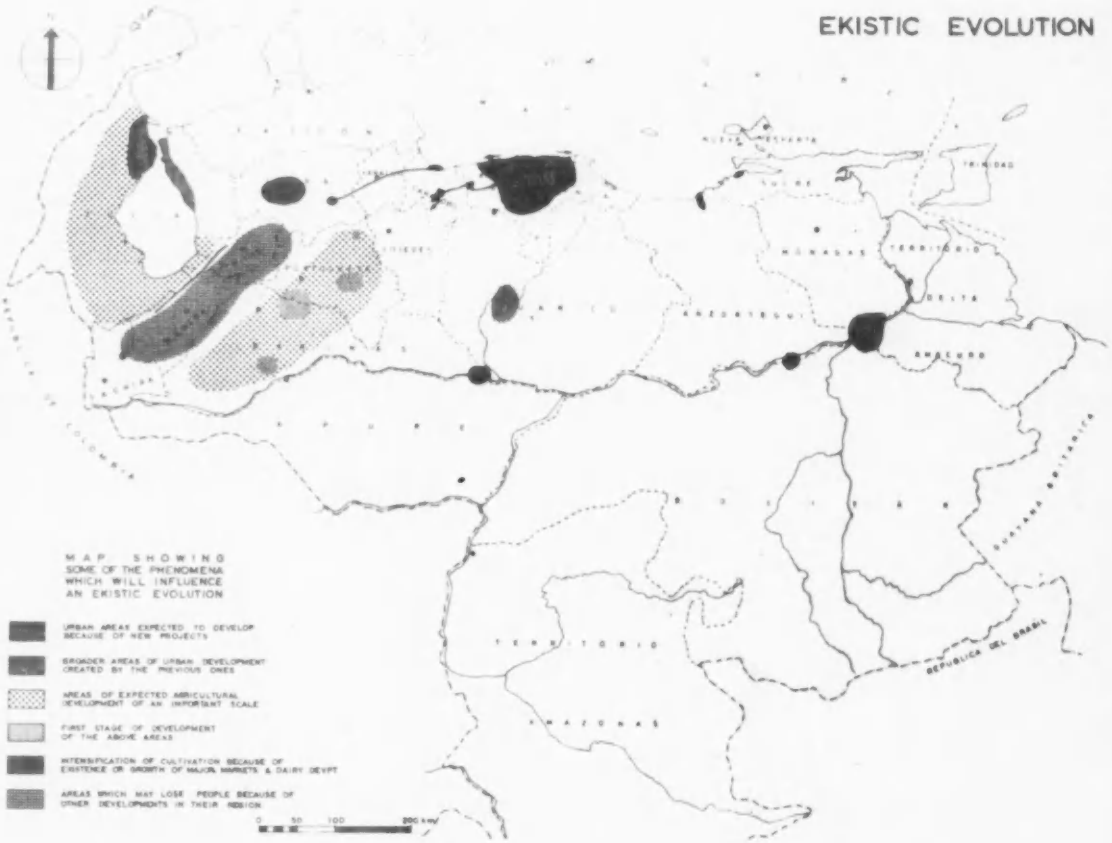
EKISTICS

ABSTRACTS ON THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

ΟΙΚΙΣΤΙΚΗ

MAY · 1960

EKISTIC EVOLUTION


MAP SHOWING SOME OF THE PHENOMENA WHICH WILL INFLUENCE AN EKISTIC EVOLUTION
URBAN AREAS EXPECTED TO DEVELOP BECAUSE OF NEW PROJECTS
BROADER AREAS OF URBAN DEVELOPMENT CREATED BY THE PREVIOUS ONES
AREAS OF EXPECTED AGRICULTURAL DEVELOPMENT OF AN IMPORTANT SCALE
FIRST STAGE OF DEVELOPMENT OF THE ABOVE AREAS
INTENSIFICATION OF CULTIVATION BECAUSE OF EXISTENCE OR GROWTH OF MAJOR MARKETS & DAIRY DEVPT
AREAS WHICH MAY LOSE PEOPLE BECAUSE OF OTHER DEVELOPMENTS IN THEIR REGION
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E K I S T I C S

ABSTRACTS

of

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EDITORIAL

For the first time Ekistics has departed from its policy of collecting together abstracts of articles which have already been published in some form or other. It is a special occasion! The International Federation of Housing and Planning is not only celebrating its twenty-fifth congress, but this is the first time it has held a conference west of the Atlantic. It will open on May 28th in Puerto Rico. This is an incident of great personal interest to the founder of Ekistics, Dr. C.A. Doxiadis, and to its editor. Dr. Doxiadis has close associations with Latin America and the editor has long had close ties with the IFHP.

To mark the occasion, Ekistics publishes a series of six articles specially written for this issue. The first five have been written by Dr. Doxiadis and four of his collaborators, all imbued with the spirit of the ekistic approach to regional development. The final article is included as a tribute to the Latin American venue of the IFHP. It is to be hoped that the emergence of yet another international bureau - the Division of Regional Development of the Organization of American States - will prove capable of "cutting the cackle and getting down to the hosses" in effectuating Latin American regional programs. In another article Jacob L. Crane speaks from his long experience of the proliferation of "perhaps too many" arrangements for providing expertese and training, but Luis Vera makes out a good case for his organization and lists an impressive array of its first undertakings. We look forward to reporting further of several of them.

In our opening article Dr. Doxiadis interprets the ekistic approach in terms of Venezuela, employing the three headings now familiar to all Ekistics readers: problems, policies, programs.

Following upon his heels comes a statesmanlike paper from Doxiadis' firm friend and associate, Jacob L. Crane. Very many readers of Ekistics - including the editor - must feel a thrill of gratitude whenever they hear this name. How many people in the field of housing and planning, especially in the international field, have been started or assisted along their road by Jake Crane, that veteran of international cooperation. His article hints that subsequent events have caused him to regret some of his earlier encouraging words. Those among us who have ever benefited from them may find this a salutary moment for a little self criticism.

It is interesting to note that Jacob Crane considers the two most hopeful areas of achievement to lie in the promotion of technical education within the country receiving technical aid and the development of local building materials - to which he might be willing to add the development of local structural skills, which can be considered part of technical education.

If we can be allowed to accept this interpretation of our mentor's hints, we can claim that the next three articles fall within the areas he indicates as promising. At the same time all three are examples of the unity and diversity, the idealism and practicality, of the spirit of ekistics.

All three articles illustrate some practical application of a general ekistic principle to a specific issue affecting rural planning. Professor Hassan Fathy is mainly concerned about ekistic policy in the approach to rural house construction in Egypt; M.G. Ionides with ekistic programming of village water supplies, primarily for Iraq and Pakistan; Professor Jaqueline Tyrwhitt with identifying the ekistic problems basic to the establishment of plot sizes for Indonesian villages. In addition all are concerned with field training programs at the three levels of the peasant worker, the skilled craftsman and the university student. The subjects handled, while as simple and down to earth as the techniques they describe, are universal and fundamental to regional development everywhere in the world: shelter, pure water, living space.

Two abstracts follow: the first a brief account of a successful one man attempt to raise the village standards of living in Basutoland. It is included partly because it is a vivid illustration of another version of the approach lauded by Professor Hassan Fathy and partly because the great continent of Africa is not elsewhere referred to in this issue, and in this particular year and in the issue for the International Federation Conference, it is unthinkable to omit all reference to this tremendous land of opportunity.

The remaining article needs no description other than its title: the use of census data to study factors affecting migration. It is abstracted from a paper presented by Donald J. Bogue to the United Nations Seminar on Population Census Data held at Santiago, December, 1959. Though almost frighteningly concise, it provides an authoritative and practical list of indexes which can be derived from census data and used to determine migratory trends in different areas.

It is hoped that this special issue of our modest journal will prove of interest to our readers. Comments upon it, or upon Ekistics generally, will be gladly received at Doxiadis Associates, 24 Strat.Syndesmou, Athens.

Doxiadis, C.A.

EKISTIC PROBLEMS, POLICIES AND PROGRAMS FOR VENEZUELA

In November 1959, I was invited by the International Bank for Reconstruction and Development in Venezuela to assist the Bank's Mission, headed by Mr. Labouisse, in their work on a four-year development plan for the country. As a result of my visit there, I prepared and submitted to the Bank a relative report.

In the present paper I try to give the broad aspects of the ekistic approach to the problems of Venezuela in the hope that in this manner certain questions will be raised which may be of some use in the development of specific programs, not only of ekistic but even of a wider nature.

A. INTRODUCTION

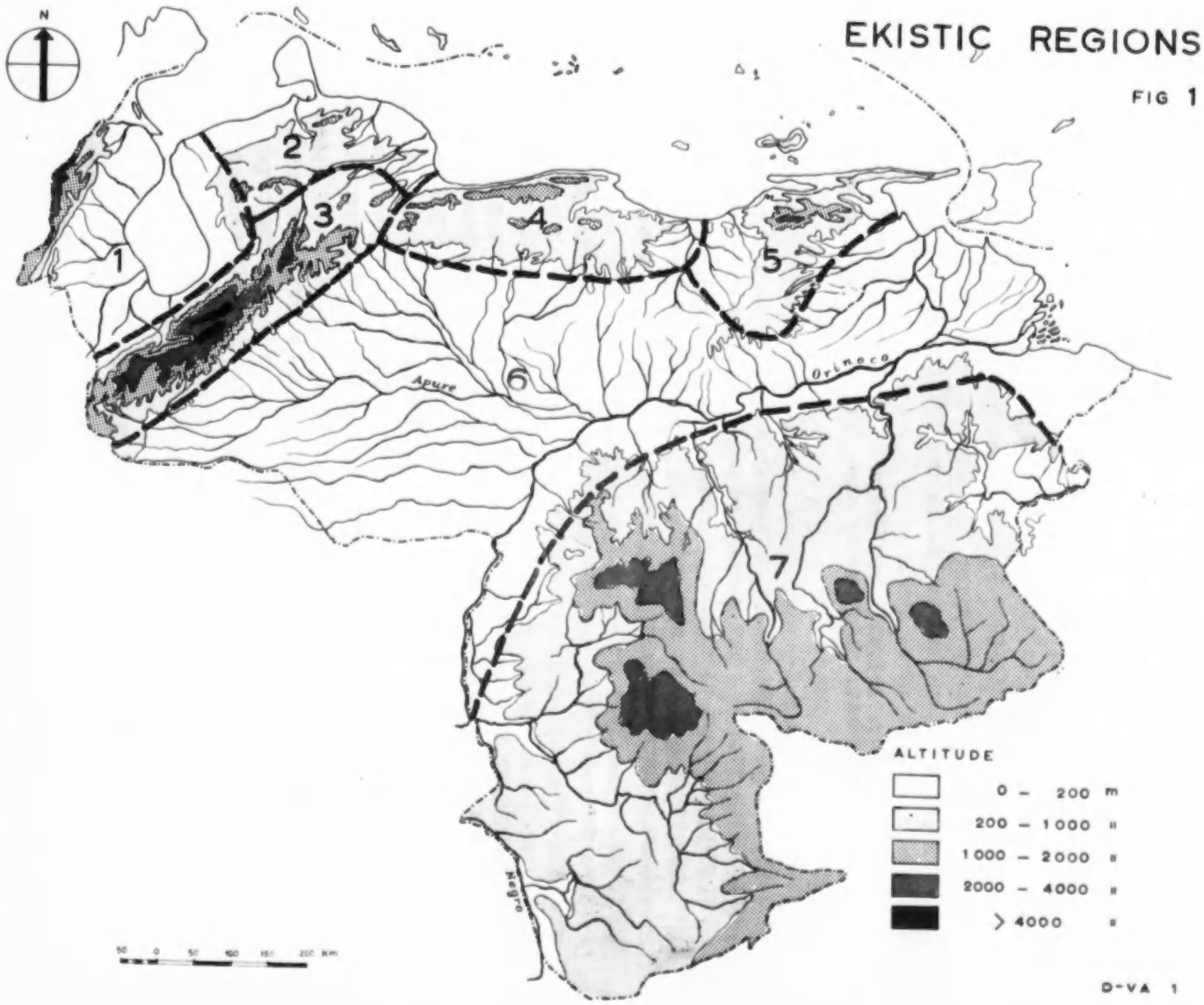
1. The ekistic situation in Venezuela, or, in more general terms, the physical living conditions of the people, is not what it should be, in spite of the fact that Venezuela has a per capita income which is higher than any other country of South America and notwithstanding its efforts in the field of housing and settlements in which relatively large amounts are being invested.

2. The situation is such that there is an imperative need for a systematic approach to the whole problem.

B. DESCRIPTION OF THE PHYSICAL SITUATION

3. In studying the ekistic situation of a country, we very often tend to emphasize the static ekistic conditions, whereas what we do need most of all is a picture of the dynamically changing situation. Ekistic conditions change continuously and at a rate which forces us to keep on changing our approach and our policy.

4. To develop adequate ekistic policies we must consider both static and dynamic aspects of our problems, with due consideration of the dynamic. And only if we develop proper policies can we draft the proper programs.


EKISTIC REGIONS
FIG 1
N
1
2
3
4
5
6
7
Apure
Orinoco
Negro
ALTITUDE
0 – 200 m
200 – 1000 "
1000 – 2000 "
2000 – 4000 "
> 4000 "
D-VA 1

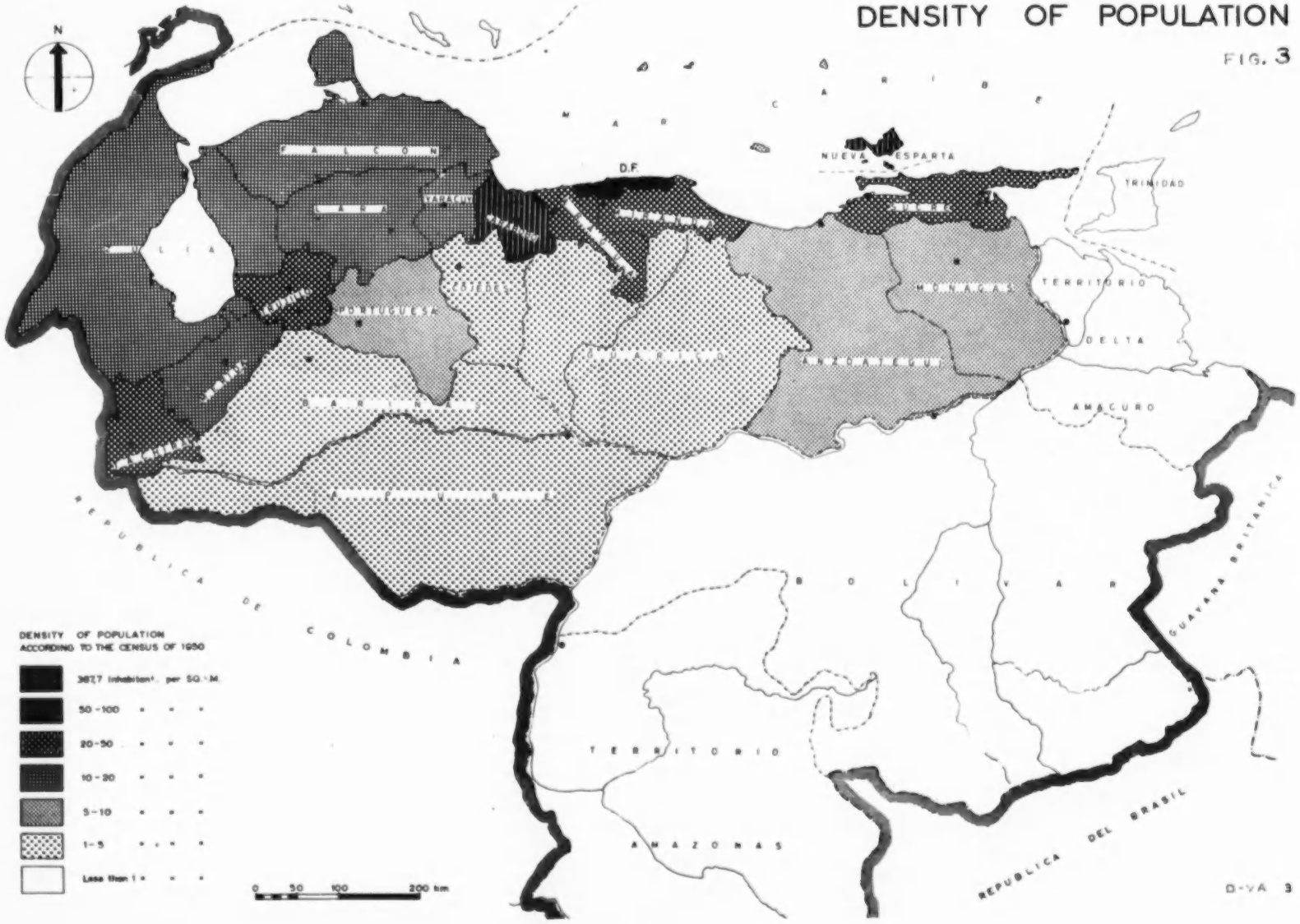
ADMINISTRATIVE DIVISIONS

FIG. 2

D-VA 14

DENSITY OF POPULATION

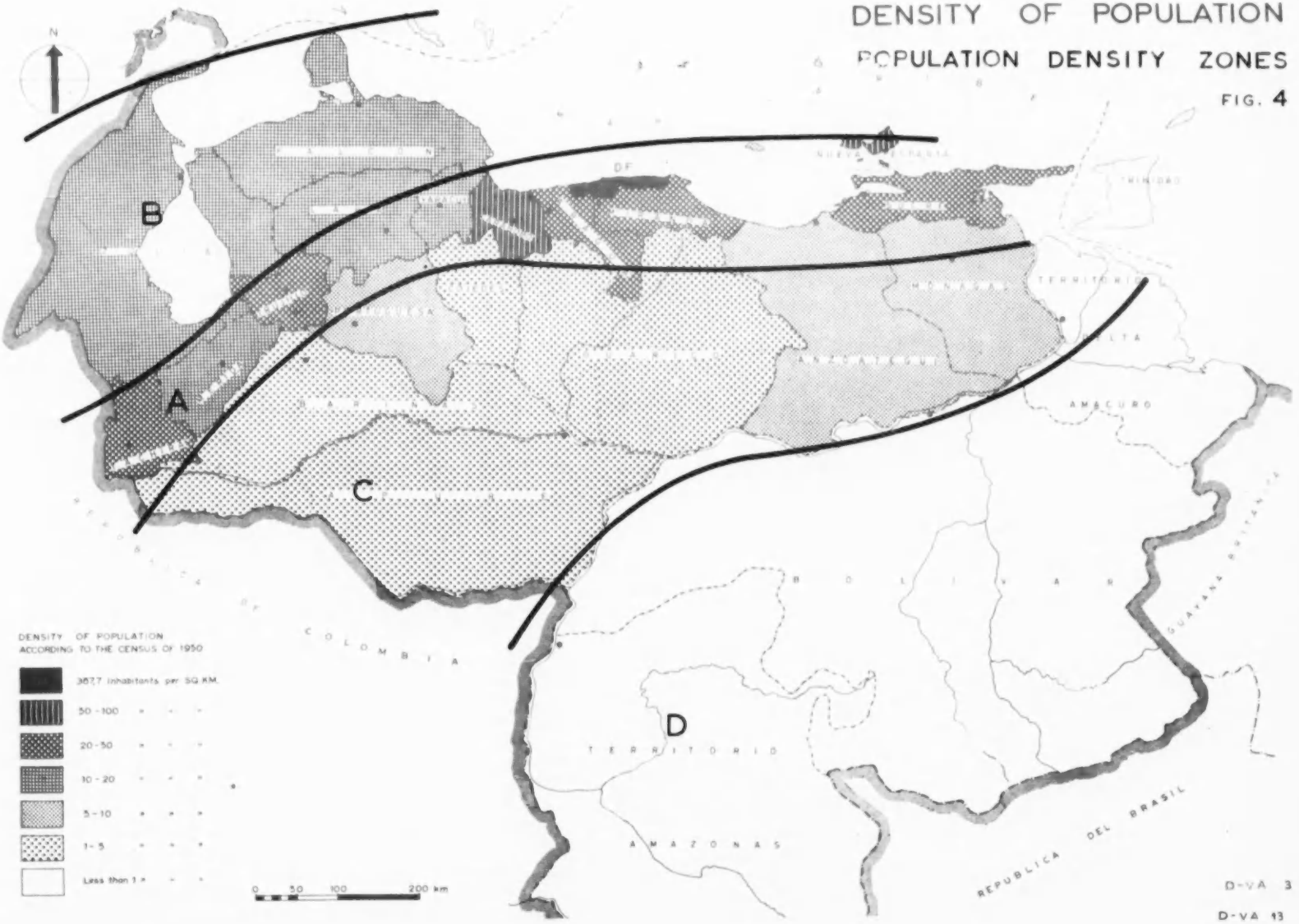
FIG. 3


N
M A R
C A R I B E
F A L C O N
D.F
NUEVA ESPARTA
TRINIDAD
T A C H I R A
T E R R I T O R I O
D E L T A
A M A C U R O
B O L I V A R
G U A Y A N A B R I T A N I C A
T E R R I T O R I O
A M A Z O N A S
R E P U B L I C A D E C O L O M B I A
R E P U B L I C A D E L B R A S I L
DENSITY OF POPULATION
ACCORDING TO THE CENSUS OF 1950
387,7 Inhabitants per SQ.-M.
50 - 100
20 - 50
10 - 20
5 - 10
1 - 5
Less than 1
0 50 100 200 km
D-VA 3

DENSITY OF POPULATION

POPULATION DENSITY ZONES

FIG. 4



5. Venezuela, for ekistic purposes, may be divided into 7 areas shown in Fig. 1: Maracaibo, the coastal area of Falcon, the Andes, Caracas, Sucre, the plain of Orinoco, and the southern part of the country.

6. One of the most important factors influencing the formation of ekistic conditions is the density of population over broad areas. In Venezuela, the areas of higher density form a big crescent developing between Tachira in the West and Sucre in the East along the North of the crescent-shaped limits of mountains and hills. These areas include the Andes, Caracas and Sucre.

7. Generally speaking, Venezuela may be divided into four areas from the standpoint of density of population: the high density areas A, the middle density areas B, the low density areas C and the practically uninhabited areas D.

8. This is the static picture of the ekistic factor population. This static picture alone is useless, if not misleading, without the parallel study of the dynamic evolution of the population. If we studied the increase of population for the decade between 1940 to 1950, we discover an altogether different picture of the overall phenomenon. If more recent data than the 1950 census were available, when this paper was written, chances are that this change would have been even more pronounced.

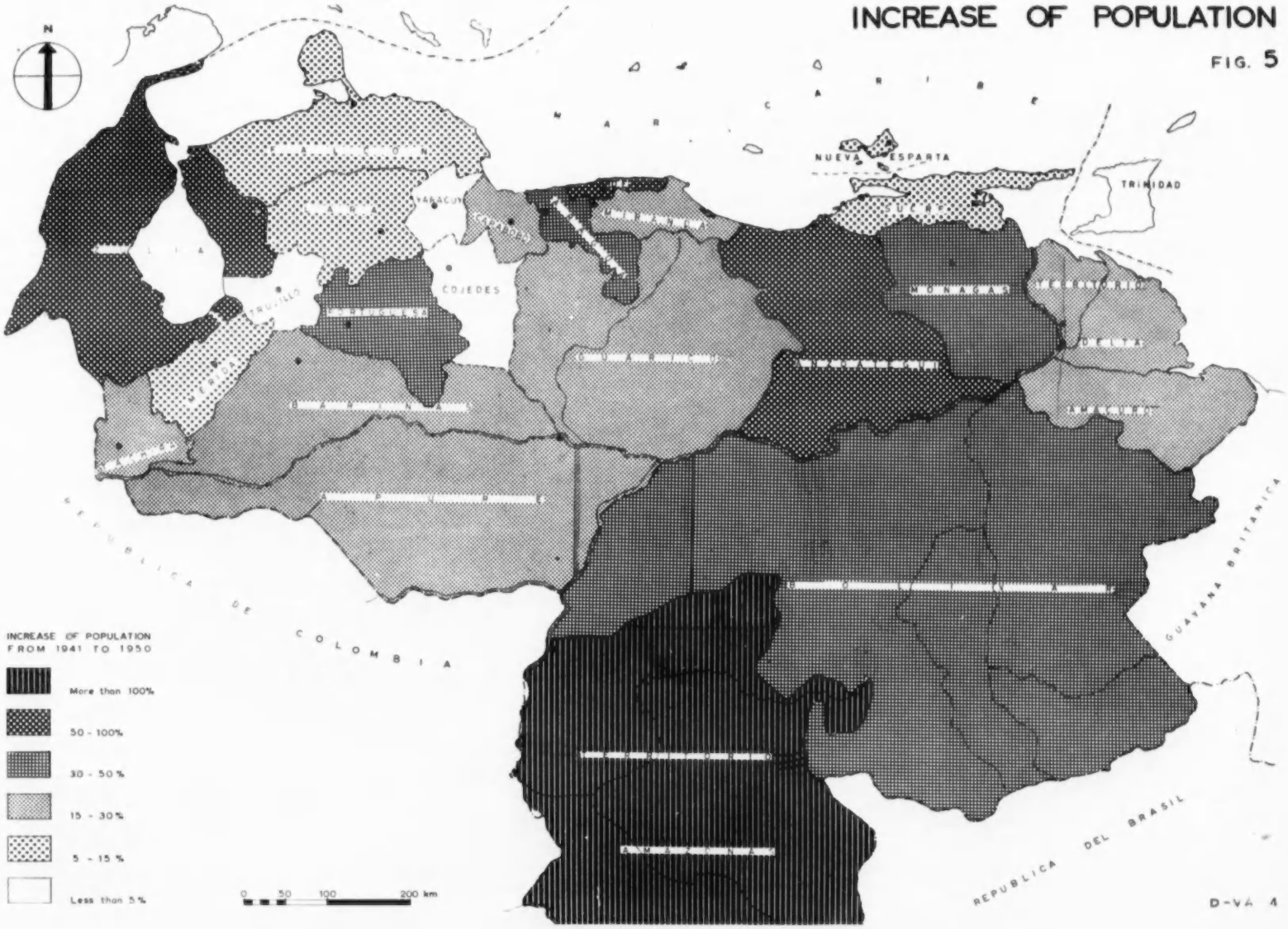
9. As shown in Fig. 5, the A areas have a very low increase of population (less than 5%), whereas areas with a very low density show as much as 100% in the same decade. Consequently, these low density areas, as peaceful as they may now seem, may present in the near future very great ekistic problems.

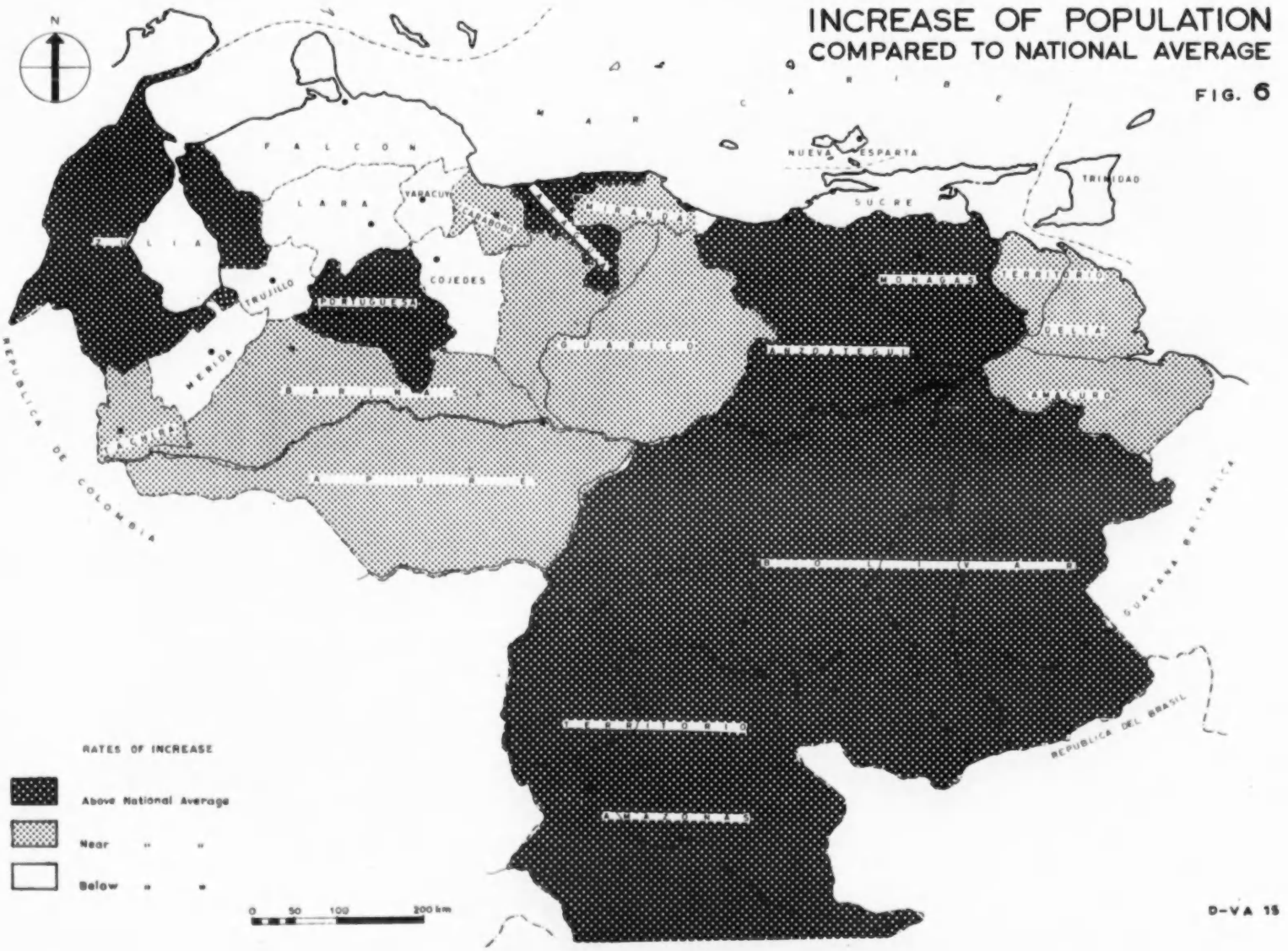
10. With regard to the national average increase in population, we can divide the country into three areas: greater, slightly lower and definitely lower than the national average (Fig. 6).

11. Now, by combining the static and dynamic pictures of population we can investigate each area separately, from a present density and a population change standpoint. From this examination we can confirm for Venezuela the following well-known fact: that the mountainous areas of Venezuela are definitely losing a large part of their population whilst the plains are gaining population, especially near the areas of oil development.

INCREASE OF POPULATION

FIG. 5




INCREASE OF POPULATION
COMPARED TO NATIONAL AVERAGE
FIG. 6
N
M A R
F A L C O N
L A R A
YARACUY
TRUJILLO
COJEDES
MERIDA
NUEVA ESPARTA
SUCRE
TRINIDAD
MONAGAS
TERRITORIO
DELTA
AMACURO
ANZOATEGUI
REPUBLICA DE COLOMBIA
GUAYANA BRITANICA
REPUBLICA DEL BRASIL
RATES OF INCREASE
Above National Average
Near " "
Below " "
0 50 100 200 km
D-VA 15

INCREASE OF POPULATION

12. These population movements are due to new conditions of security, better health conditions in the plains, industrialization in the plains, and the development of new agricultural areas. As a result, we may assume that these trends will definitely continue in the near future.

13. Similar conclusions may be reached from a study of the ekistic centers which have developed all over the country. In Fig. 7, which shows the ekistic centers, the crescent of major settlements coincides with crescent A of the highest density in Fig. 4.

14. The following step in our study should be directed towards housing conditions. The most important relative phenomenon in this respect is the type of dwellings built throughout the country, as shown on Fig. 8. The distribution of these houses in the various administrative areas shows a distinct variation of conditions. In some areas permanent houses exceed by far temporary ones, whereas in others the temporary houses by far exceed the permanent ones.

15. If we go a little further in our study and we consider methods and materials of house construction and the water and sewage facilities, we find that there is a corresponding relation of their distribution to the house types over the country.

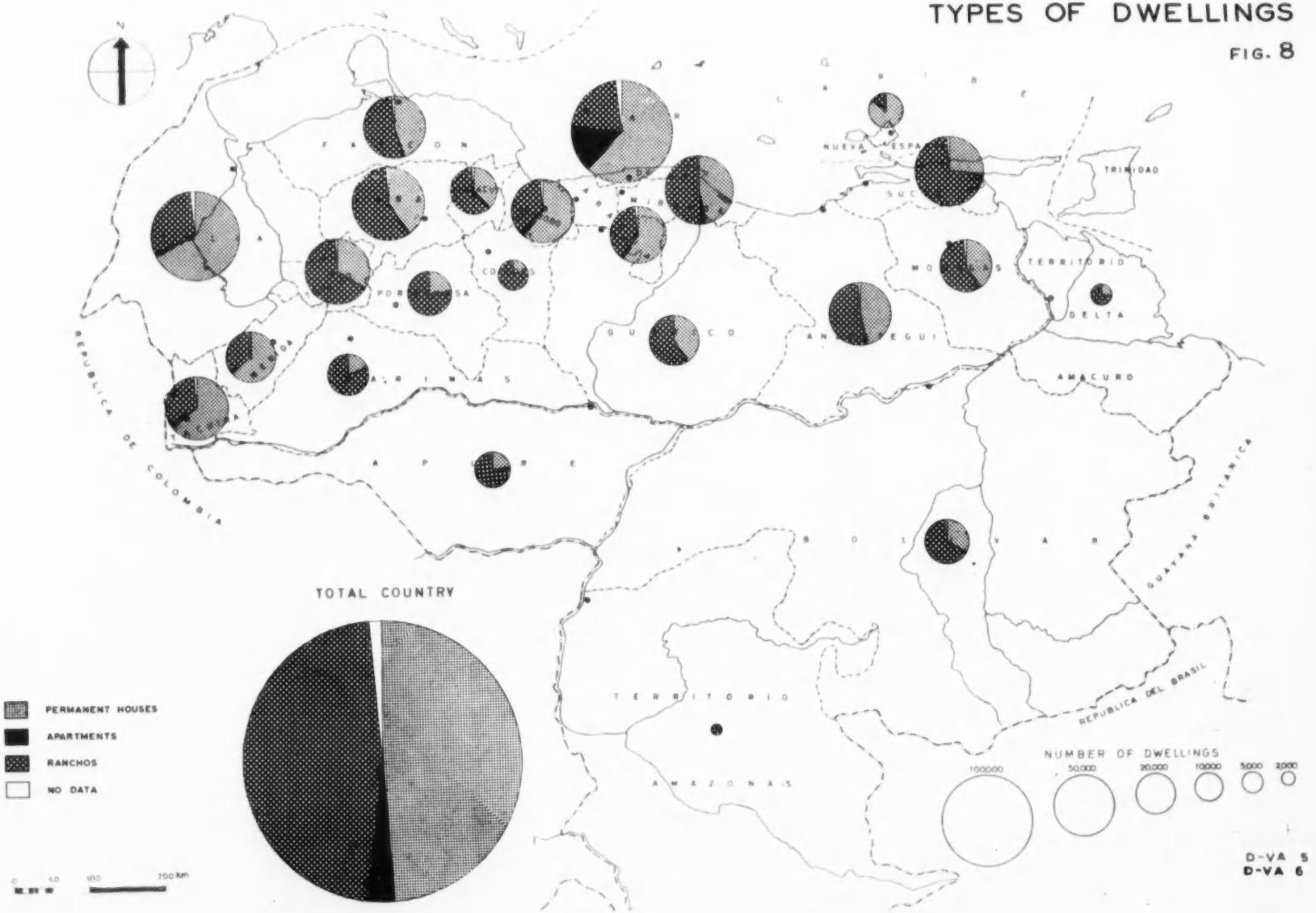
16. Taking our analysis from the broad administrative regions to the districts, municipalities and communities, we can define more precisely the areas of the country which are suffering enormously from very bad housing conditions and community facilities.

17. On the basis of the previous analysis we can maintain that the country is divided into several ekistic areas as follows:

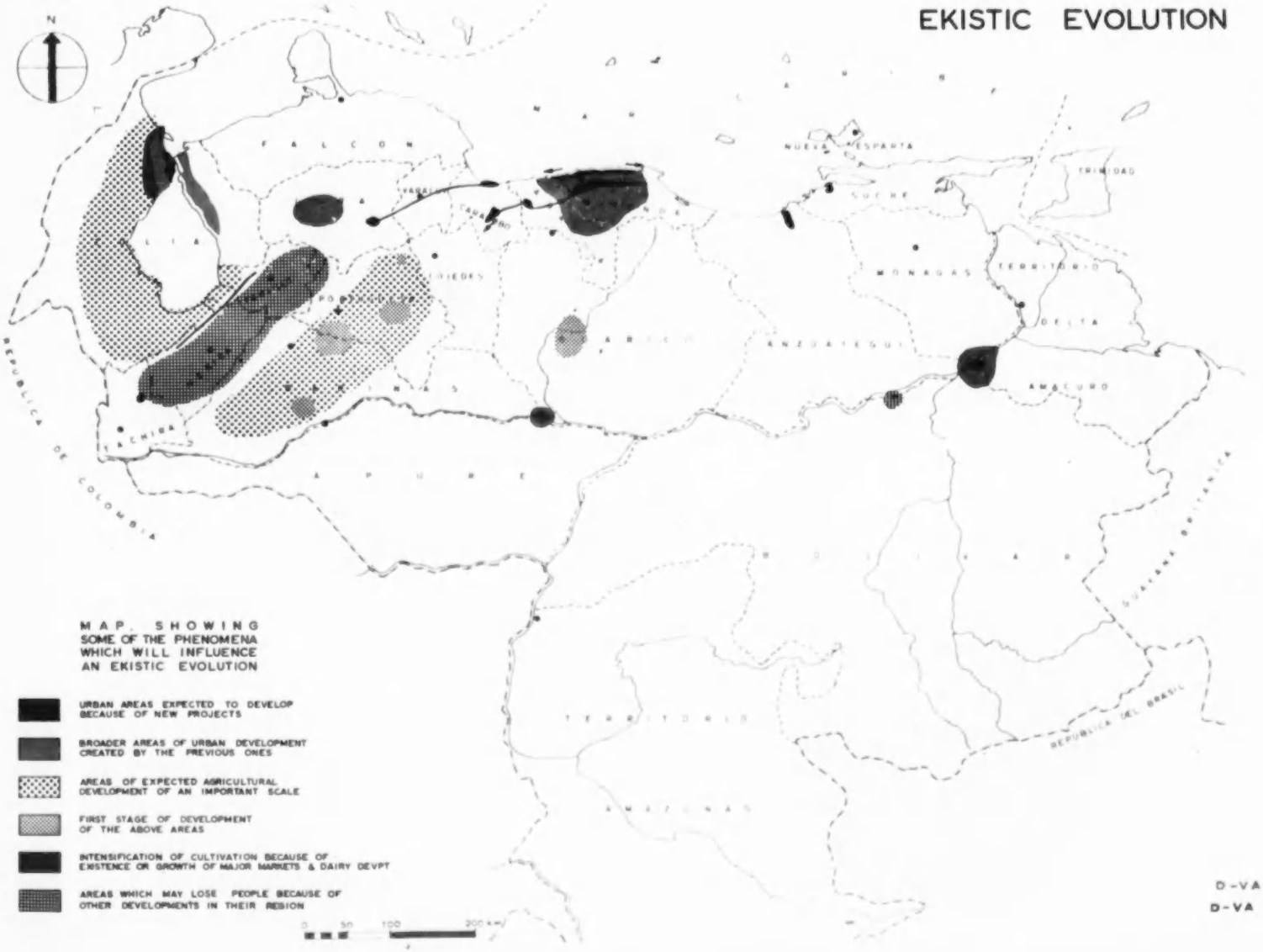
a. Developing areas, where the population is on the increase. In the urban parts of these areas the increase of population is due to industry and oil, whereas in the rural regions, it is due to governmental policies for the development of those regions. It is in these developing areas that new problems are faced, caused by the influx of population, for the accommodation of which no proper provisions have been made.

TYPES OF DWELLINGS

FIG. 8



EKISTIC EVOLUTION



D-VA 14
D-VA 16

b. Depressed areas, which are losing population with the decline of their economic importance. In the urban regions of these areas old market towns are on the decline because of the construction of new highways that transfer the centers of economic activity to new areas. In the rural regions the mountainous areas are abandoned because of poor soil and erosion.

c. Normal areas, which do not suffer from any change. To this ekistic area belongs a large part of the countryside, especially in the bigger coastal plains.

18. The evolution to be expected of the ekistic areas described above is shown on the map of Fig. 9. Due to the lack of more recent census data this study should be considered a method of approach to the problem rather than a "numerical solution".

19. The map shows the urban areas expected to develop, the broader areas of urban development created as a result of urban development (arrows show the main direction of growth, dark lines show development along some highways), the areas of important agricultural development to be expected as well as their first stage of development, intensity and variation in development because of urban growth and the creation of new markets, and the areas which may lose population because of faster economic development of other areas.

C. PROBLEMS

20. Based on the previous ekistic analysis we can now demonstrate the problems in the various ekistic areas.

21. First in the urban areas. In these areas the problems are due to the very large concentration of population in areas of few and inadequate urban settlements. This unconformity is due to the unbalanced, in fact the lack of development of the countryside in relation to the urban areas.

22. As a result of urban rapid growth, a high percentage of population in urban areas live in "ranchos" - temporary sub-minimum houses - creating many other problems, such as lack of adequate community facilities, very bad traffic conditions and very bad housing conditions in general, especially in the areas of oilfields.

23. For all these problems many of the solutions have already been tried, such as the creation of super-blocks, etc. But, more often than not, they do not correspond to the actual needs. Unless a complete change in policies takes place, there will be no amelioration of the existing conditions, as the population will continue to grow even at higher rates, the traffic situation will get worse and the bad conditions near the oil areas may only be expected to get more and more impossible to cope with.

24. Concerning the rural areas, the main problems stem from the fact that there was never actually normal settlement in the plains. The reason for that in the past was the lack of land ownership, as a result of which people kept on moving from place to place, the spreading of malaria, and the poor soil. Now, with the wiping out of malaria and the building of new national highways, new chances for the development of these areas exist. However, little is being done along these lines and the people settle in the plains without any guidance, creating new and greater problems as time goes by.

25. Another major problem in the rural areas is the existence of small settlements of 50 to 100 inhabitants. Such small settlements restrict community organization and make impossible the development of community services.

D. POLICIES

26. Quick action for the amelioration of ekistic conditions in Venezuela, as in many other countries, is indispensable for many reasons. In the field of economic development such action is necessary to assist industrial and agricultural growth as well as the growth of mining towns, fisheries, etc. From the standpoint of social development such action is needed to help social adjustment and normal evolution of the various groups. Such action is also necessary to meet emergencies such as floods, earthquakes, etc., as well as for helping the implementation of special governmental programs.

27. Ekistic action will also bring a balance between urban and rural development - to say nothing about increasing employment of the semi-skilled and unskilled labour, thus gradually training big masses of people to higher skills.

28. The broad policies on which to base an ekistic program may thus be summarized as follows:

a. To balance investment in housing with the investment in other activities and especially in road construction.

b. To mobilize private initiative so as to gradually take over home building activities in the years to come.

c. Train people at all levels, from the highest category of planners down to the lowest level of unskilled labour.

d. Develop materials and methods of construction for all phases and types of work.

E. PROGRAMS

29. In order to achieve the above targets we have to definitely develop two programs: A special program of immediate action, in order to build the urgently needed projects and to complete or continue projects which have already begun, and a long-term program of careful study of the problems and needs, the development of long-term policies and specific long-term programs, and their implementation and perpetuation.

30. The Special Program of Action will start immediately, while the Basic Foundation Program, the long-term program, will begin later, but will start to be studied soon. The Special Program of Action should cover a two to three-year period and include the urgently needed housing and facilities projects for industry, agriculture, education, welfare, public health, etc. It should also try to incorporate

special programs aiming to wind-up previous unrealistic projects already started and should continue those programs which already started and are considered reasonable and desirable for the overall effort. Last but not least, projects should not be carried out in depressed areas which are destined to remain economically depressed.

31. This Special Program of Action will also have to face such special projects as those considered of absolute urgency for the amelioration of conditions in Caracas, the Federal Capital. The future of Caracas should be envisaged in a way that will guarantee the normal development of the city outside of the narrow valley where it now lies.

32. Two major policies can be followed in this respect:

a. The creation of a new capital, which does not look very reasonable under the present conditions, or

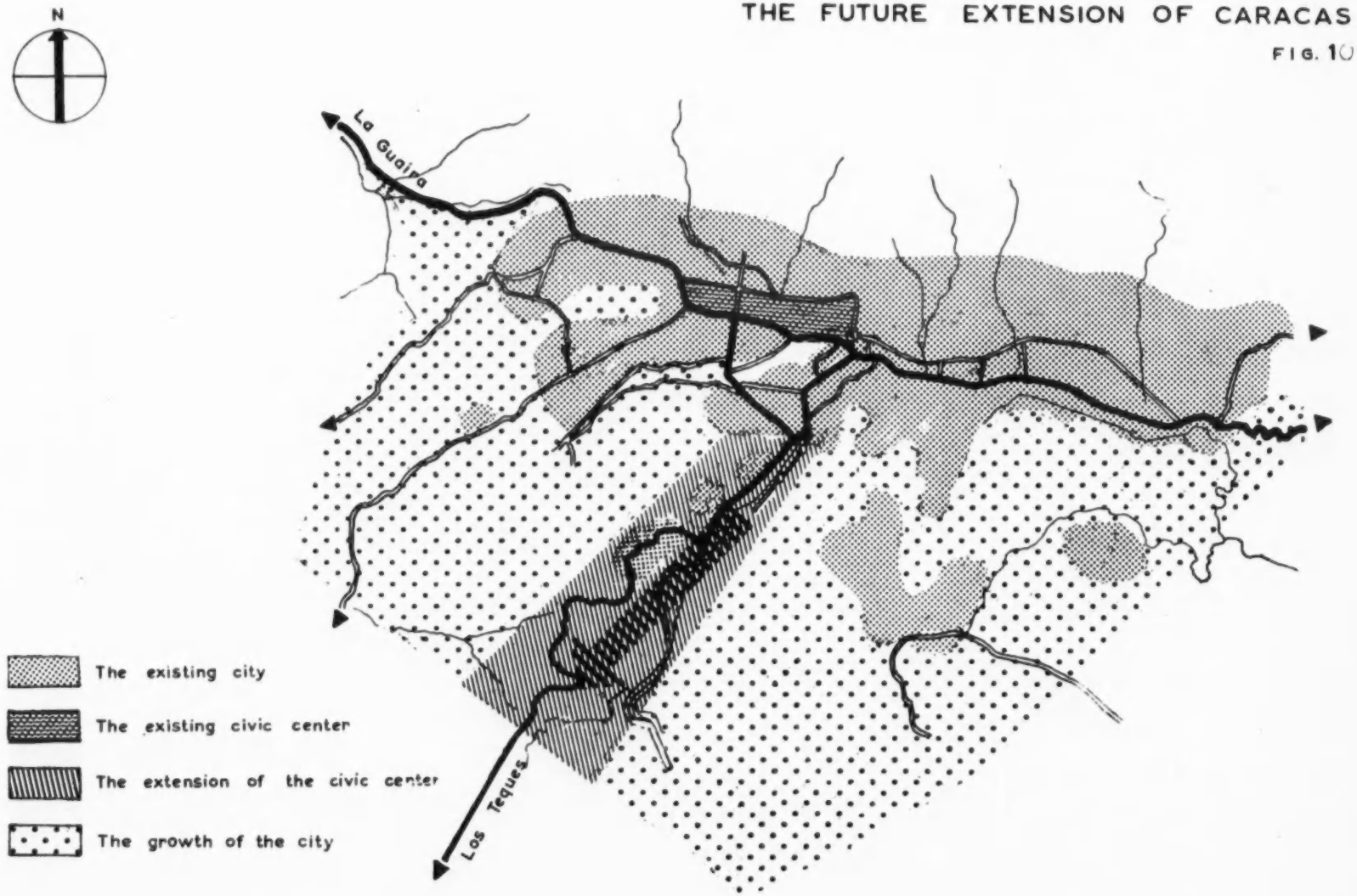
b. The creation of a new center for Caracas outside the present overloaded area, which is more advisable and should be looked into very carefully.

33. A new approach to the whole urban problem of planning the urban area of Caracas has to be conceived. If Caracas remains where it is at present, it will very soon stagnate because of a transportation standstill. As a result, the Government will have to invest more and more money in order to open new arteries, which are going to bring new functions and more traffic into the narrow valley of Caracas. This traffic will require the opening of new highways, more expenditures will have to be made for demolitions, and Caracas will remain in the viscious circle in which it has been for the last few years, with less hope for improvement.

34. As indication of the above recommendations, I show a plan (Fig. 10) of how the problem of the future expansion of Caracas may have to be envisaged. Such a proposal, however, requires a much more thorough study, towards which no steps have been taken as yet.

THE FUTURE EXTENSION OF CARACAS

FIG. 10



D-VA 17

35. The long-term program for the country requires a thorough ekistic survey throughout the country. If this is not launched immediately, the long-term program cannot be worked out within the next two years and, as a result, cannot be implemented.

36. The country will continue implementing existing projects, and - let me repeat - there will be no real hope for any solution.. The Special Program of Action is justified only as a temporary measure which will prepare the ground for the forces of the long-term program of the country.

Crane, Jacob L.

INTERNATIONAL COOPERATION IN EKISTICS

1. During recent years I have lost touch with some of my professional friends in all parts of the world. Accordingly, I take this opportunity to greet them, through this journal, which circulates so widely. Further, my little paper constitutes a sort of Report to the many colleagues who have worked with me internationally in planning and housing and related matters. I want to give my impression of the present condition of international cooperation in this broad field.

2. You can see what a convenience it is to use the term "ekistics". I use it, with due acknowledgement to Dr. C.A. Doxiadis, who devised it, to signify the science (and art) of human settlements. The term comprises planning and housing and community facilities. It is intended to include the economic and social aspects as well as the physical and the aesthetic. nd it deals with human settlements in geographic areas which may range all the way from a village to a region or a nation. In fact, I should have put these in the reverse order, because ekistics as a science (and an art) properly deals with regions and towns and villages <u>within a national policy</u>.

3. It pleases me also that this resumé is published in the issue dedicated to the XXVth biennial Congress of the International Federation for Housing and Planning. My own interest in the Federation does cover the thirty-five years beginning with the 1925 Congress in New York City, when wise men like Raymond Unwin, Barry Parker and Thomas Adams (Frederick Adams the Elder!) were causing young Americans like me to dream of good human settlements everywhere.

4. Even before that I had worked a little outside my own country. And in 1931 I tried my hand at international cooperation in China and in the USSR. That experience opened my eyes, and it whetted my appetite for a world-wide campaign in what we can now call ekistics. Following World War II I played a key role, I think it is fair to say, in organizing for international cooperation on the part of United States agencies, the United Nations agencies, and regional international agencies - ECE, ECAFE, OAS, Caribbean Commission, etc. (I can remember the day in Jim Fraser's office in Singapore when we first launched the idea of an Asian regional organization for IFHTP). All of this has proliferated and taken form, and international cooperation in this field has become respectable, with permanent staffs, some money, and many devotees.

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4. Even before that I had worked a little outside my own country. And in 1931 I tried my hand at international cooperation in China and in the USSR. That experience opened my eyes, and it whetted my appetite for a world-wide campaign in what we can now call ekistics. Following World War II I played a key role, I think it is fair to say, in organizing for international cooperation on the part of United States agencies, the United Nations agencies, and regional international agencies - ECE, ECAFE, OAS, Caribbean Commission, etc. (I can remember the day in Jim Fraser's office in Singapore when we first launched the idea of an Asian regional organization for IFHTP). All of this has proliferated and taken form, and international cooperation in this field has become respectable, with permanent staffs, some money, and many devotees.

5. For the past seven years I have been just as active internationally; but un-officially, as a private person, and within a more restricted scope. So I do not pretend to know all that has been going on. But I have been watching and listening, something like a parent, and I should like to outline the way it looks to me now.

6. National Agencies of Government. From the beginning it has seemed to me that the problems of human settlements required and justified a major interest on the part of every national government and, further, organization arrangements within each national government for helping to solve these problems. In most international cooperation this principle has been recognized. More to the point, the popular and political pressures have been active in this direction. And, assuming the principle to be sound, here we can report great progress. In 1945 only a few countries had established national agencies and formulated national policies and programs. At present, one has to search the atlas to identify the countries which have not assigned responsibility in ekistics to a ministry or a department or some other type of agency. Not all are firmly established, and not all are doing well. But most countries have them. Even the newly independent governments, with few exceptions, make room in their organization for this function. Last spring I saw them in some of the brand new African countries, expressing their concern and their intent in respect of the very human and, equally vital economic problems of human settlements. Here and there around the earth some of these agencies may seem to be badly organized, or meagerly staffed, or overly ambitious. But nearly all countries have made a start, and some are very far along with national policies and national programs. The task of stimulating the creation of such national agencies is nearly over.

7. Men. For purposes of evaluating the present condition of international cooperation in ekistics, I like to catalogue my observations in respect of Men, Money and Materials. First let us look at the manpower engaged in this field of international cooperation.

8. The process of making expertese available from one country to another is usually called technical cooperation or technical assistance. The arrangements are made either bi-laterally or through multi-national organizations. Here again the scene has changed very greatly since 1945. Before that, specialists in this field were drawn from one country to another only rarely and sporadically, and there were scarcely any organized arrangements for doing so, either bi-lateral or multi-lateral. Now "the woods are full" of such arrangements - governmental, multi-governmental, and non-governmental.

9. Many governments have established offices for recruiting these specialists among their nationals, and for arranging to lend them or otherwise make them available on request from other countries. An impressive (perhaps an appalling) number of international agencies offer assistance for such technical cooperation - UN and OAS (Organization of American States), and their numerous subsidiaries; and, in connection with various missions, IBRD (International Bank for Regional Development) and its related agencies. Sometimes UNESCO, FAO, and WHO are drawn in to the complex of problems which relate to human settlements.

10. Further, a number of private non-profit agencies also make technical assistance available.

11. And, finally, there are hundreds of private professional firms and individuals who are engaged by governmental or private interests in countries other than their own. Some do well; some (too many) are "carpet-baggers", to use an American term of scorn.

12. I should have said earlier that these many arrangements not only send experts from one country to another, a number of them also provide technical assistance by bringing men and women from their own countries to more experienced countries for observation and training.

13. In summary, we have many, a great many, perhaps too many, arrangements for providing expertese and training. They tend to overlap and compete, and to confuse the beneficiaries. And, all told, they seem to require a very considerable manpower only to administer and "coordinate" their programs.

14. It is my impression that the expertese and the training are very often not effective. Often the wrong experts are recruited, or they are assigned to the wrong situations, or the time period is too short (or too long). Often the training "misses fire" badly. Usually something is gained in international understanding and friendship, but the technical cooperation as such seems to me not to have done well.

15. I say this in full recognition of experience with my own inadequacies, and with the inadequacies of some of the experts whom I have recruited and some of the training which I have helped to arrange.

16. It would require another paper to describe possible improvements in the present formulae for providing expertese and training internationally in this field of the science and art of human settlements. I believe it needs to be clarified and simplified and made more competent.

17. Meanwhile, I might cite three examples of new, and in some ways, more promising arrangements. One illustrates the principle of technical cooperation from another country in helping to train manpower in their own country. I think of the program of the Development Board in Iraq. There the national ekistics policy and program, developed with the consultation of Doxiadis Associates, includes a series of establishments to train manpower, ranging all the way from construction artisans to professionals. That kind of thing has begun to develop in many situations. It seems to me that this method, producing the manpower in their own environment, may do better in the long run than the sprawling arrangements for sending quick experts or bringing quick trainees from their country to a strange country.

18. The second new method of providing manpower illustrates the principle that educational centers, like the universities, which have as their main purpose the training of their own nationals are not per se well adapted to training foreigners in the field of ekistics. It is my impression that a great deal of the training of foreigners by that method has been done badly. An alternative is the establishment of institutions designed especially and specifically for this peculiarly difficult kind of training. Let me mention a few that seem to me to show great promise in this way, all relatively new, and all drawing on international expertese for the training process:

19. The Interamerican Housing Center at Bogota started a few years ago with a flourish: (it is my claim that I helped to initiate it). It is reported to have been in some difficulty. I believe it will come through successfully. The School of Town and Country Planning in Delhi, with T.J. Manickam as Director, is considered to be doing well. A School of Regional and City Planning has recently opened in Bandung. The International Institute for Social Studies at The Hague is offering a curriculum in regional planning, under my old friend J.C. Thijsse, and I look for it to produce effective professionals from many countries trained by an international group of lecturers and instructors. Finally, just now getting under way on an international scale, the Athens Technological Institute, in its beautiful establishment overlooking the Acropolis, is beginning to bring students in ekistics from many countries to be trained by an international staff for work in their own countries.

20. The third new method is illustrated by the Division of Regional Development in the Panamerican Union, which is described by Luis Vera elsewhere in this issue.

21. Money. With the oncoming of the United Nations, UNRRA, IBRD, the Marshall Plan, and other formulae for international aid, many governments seemed to hope that multi-lateral or bilateral grants or loans of money would be available for housing and community facilities, that is, for the reconstruction or improvement of human settlements. A few loans and grants have been made for highways, water supplies, sewerage, etc., and a very few for housing, mainly demonstration projects. All told, billions have been loaned or given through national and international agencies for economic development, but very little indeed for human settlements as such. A dozen agencies are empowered to do so, but none has done much, and they all resist the pressure to do so. Money has not become available internationally for housing and human settlements.

22. The reasons for this are clear. First, housing utilizes mostly local materials and labor and does not directly require much foreign exchange. Second, housing as such does not produce foreign exchange to repay loans or "balance the payments". Third, the economists who dominate the international aid programs rightly consider that it is wise to first build up the economic and productive base so that the host country can then afford its own program for human settlements.

23. In several situations IBRD missions have included ekistic studies to help find the place for housing, etc., in the national economy. This is a great help. The Ford Foundation and Harvard have done likewise in the national economic planning of Pakistan. Other international and bilateral missions have been undertaking similar studies. The UN Special Fund may include these problems in the broad studies for which it provides assistance.

24. As one result of this situation, the countries and the agencies for international aid have turned to programs which minimize the need for international loans and grants for the purpose of improving their housing and human settlements.

25. Two very promising types of intra-national programs, with international technical cooperation, are aimed, among other purposes, to make the most of limited money resources and thus to speed up the improvement of human settlements. One is the aided self-help type of program. Often, where the money resource is very meager, the potential resource in man-hours of spare time and in the family desire to improve its own environment, make a combination which, once organized and provided with modest technical and material assistance, can work wonders. It has done so, for example, in Greece after the war, in Puerto Rico, in Chile, etc.

This method, one of the most ancient methods the world over and one of the principal subjects of the present IFHTP Congress, is showing good results both in the physical improvements and in the increase of self-respect and satisfaction and aspiration on the part of the participants themselves. I am proud to be identified with this movement.

26. The second method, now coming on in many countries, is the stimulation and upbuilding of institutions for the safe accumulation of small savings to be used for improvement of housing and communities. International cooperation in this direction has begun during the past few years.

27. Meanwhile, I should mention that a few private loans have been made internationally during the past few months for housing as such. And the new Interamerican Development Bank may consider loans for this purpose.

28. Materials. Even though I have tried to condense this little story, I can see that the paper is running too long. Accordingly, I will make a few points about building materials and equipment, and finish with some general observations.

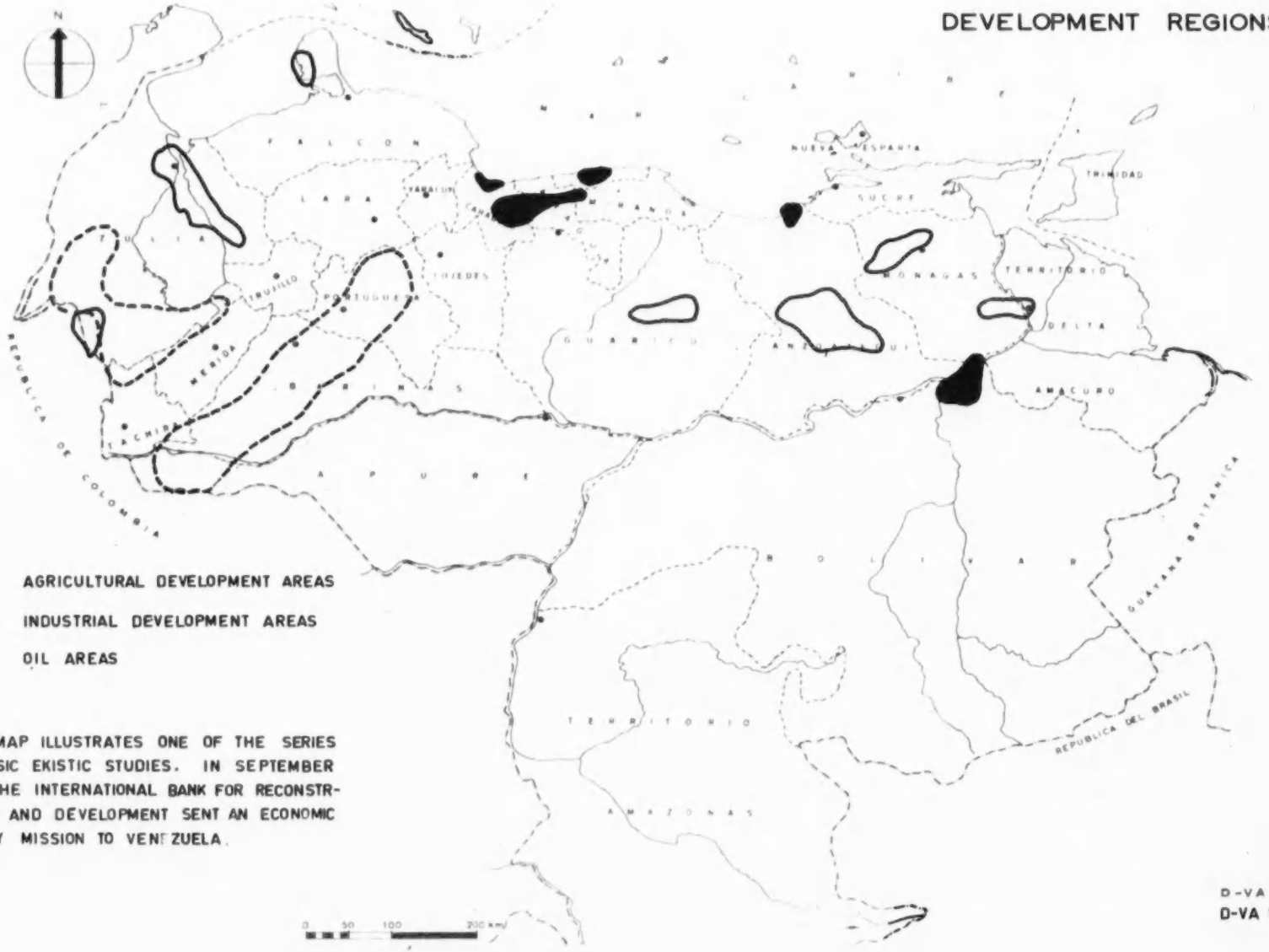
29. The furor about international trade in prefab houses and components has largely subsided, because it is generally not practicable. Some manufacturing methods imported into less industrialized countries have failed miserably. International loans and grants have not been used extensively for export-import of housing materials as such.

30. However, international cooperation since the war, in ideas, in expertese and in money, have greatly stimulated the provision of facilities for the production of housing materials within the host countries.

31. To me this trend seems appropriate and inevitable. The upbuilding of intra-national production of the materials and equipment for housing, etc., can constitute a big factor in general economic development as well as in strengthening the resources for the physical and social improvement of the human communities.

32. As a resumé of the present situation of international cooperation in ekistics, this paper is also intended to throw some light on the two principle topics of the Congress. Implicit in all that I have said here is the intimate relationship between physical planning and

DEVELOPMENT REGIONS



THIS MAP ILLUSTRATES ONE OF THE SERIES OF BASIC EKISTIC STUDIES. IN SEPTEMBER 1959 THE INTERNATIONAL BANK FOR RECONSTRACTION AND DEVELOPMENT SENT AN ECONOMIC SURVEY MISSION TO VENEZUELA.

D-VA 14
D-VA 18

economic and social development. The inclusion of "ekistics" in the present IBRD economic development survey of Venezuela is a good illustration. In this same connection, I would like to refer again to the ekistic program of Iraq, where - for the nation, the regions, the town and the villages - a policy and program were formulated, and then the planning, design, construction, management, research, training, and production of materials were all undertaken in a reasonably coordinated and synchronized manner.

33. The site of the Congress, Puerto Rico, is one of the best places to observe well-organized programs of self-help and mutual aid housing.

34. Let me only say further that international cooperation in ekistics requires the very best talents; in understanding something of man's condition and of man's perplexities; in undertaking to interpret potentialities and to lead with sensitive perception; in trying, in humbly trying, to help in the endless pursuit of happiness.

Fathy, Hassan

AIDED SELF-HELP OR COOPERATION?

1. During his work in developing the building plans for the Egyptian village of Gourna, Professor Fathy lived among the villagers of Gourna, trying to advise and organize the latent architectural and artistic forces existing among the villagers and, through their cooperation, to achieve a well-organized and alive human settlement.

2. Gourna might have shown the way to a realistic national rehousing policy, a building plan that would have provided the millions of houses that Egypt needs at a price she could afford. Such plans have from time to time been mooted, based on the orthodox materials, methods and building systems used in current practice, but no such plan has ever got beyond the first discussions in committee. The reason is always the same: too little money. Inevitably, so it seems, somewhere between the planning stage and the building, the cost swells and puffs itself up to such a size that the accountants take fright and the scheme is dropped. Patiently, the planners make another plan; the result is the same: it always costs much more than the estimate.

3. The Building Contractor System. Why should this be? There is one basic reason: no architect normally designs for peasants in the villages. No peasant can ever dream of employing an architect, and no architect ever dreams of working with the miserable resources of the peasant. The architect designs for the rich and thinks in terms of what the rich can pay for. Most of the architect's work is in the town, and so he takes into account the resources of the town; he assumes the existence of experienced building contractors and the sophisticated materials used in town building, and he assumes, naturally, that his client can pay for them. The architect thinks automatically of concrete and contractors, wherever he is asked to build, and he seldom envisages any alternative to the system of private urban building.

4. All planning authorities are, of course, dependent upon their architects for technical advice on building. Thus planning authorities acquire, perhaps without realizing it, the architects' preconceptions of rural housing, and get a picture into their minds of how houses ought to be. They see them built of concrete, and built by ordinary commercial building firms.

5. These are, then, two factors that contribute heavily to the high cost of rural housing schemes: The first is the expensive materials used, the other the system by which the execution of the work is placed in the hands of building contractors.

6. On the other hand, there exists a perfectly adequate and very cheap building material in mud-brick. I hope to show that there also exists a method of organizing construction work - on any scale and in any location - that can save all the heavy expense associated with building contractors. Just as the peasant's building material - mud-brick - is only made available to us if we adopt the peasant's building techniques, so too we can only build as cheaply as the peasant if we base our organization of the work on the peasant's practices.

7. It is only recently that Governments have taken an interest in the miserable and rapidly worsening conditions in which most peasants live. In the same way, although people have been building houses for themselves for thousands of years, it is only very recently that they have begun to consult architects about the design of their houses. Earlier, a house was the sole creation of a builder (if the client was a well-off citizen in a toan) or of its owner (if he was a peasant in the country).

8. When a Government or other Authority wishes to build, it obtains technical advice from architects. The architects design and prepare estimates with the idea that the work will be executed through the customary agency of the commercial building contractor. For a project in a town - a hospital, perhaps, or a block of offices - the cost of building done in this way is acceptable to the Authority. But when the Authority comes to consider large-scale building in the country, particularly the rehousing of great numbers of peasant families, then at once the enormous cost of the project condemns it as impracticable.

9. There are two further disadvantages in having big rehousing projects executed by a private contractor. The first is that the primary contractor is almost as remote from the work as is the planning authority, so that he cannot exercise any detailed control over the building. The chain of responsibility, through jobbing-builder, sub-contractor, primary contractor, to the planning Authority is so alternated that no precise check can be kept on the cost of individual items. Neither is the contractor in close contact with the labour supply so that work may become held up or unreasonably costly because a sub-contractor has no workers to do it.

10. A second disadvantage is that when a project is sufficiently big, it can disturb the labour and materials markets so much that the prices of both are forced up, well above their ordinary level. Thus instead of being cheaper, houses may actually be dearer by the dozen. No architect knows the real cost of building; he knows only the prices usually quoted by contractors. Not even the contractors know the exact cost. They are at the mercy of the economics of the trade, and cannot quote with any confidence for projects unfamiliarly large.

11. Why then do the Planning Authorities stick to the contract system for housing projects? Simply because they rely upon their architects for technical advice, and the architects have no experience of any other method of executing work.

12. Aided Self-Help: the normal version. One alternative, though, has gained some favour recently. This is the system known as Aided Self-help, and rehousing schemes based upon this method of securing labour have been enthusiastically fostered by United Nations agencies, etc. Briefly, the principle is this: the Government, or the United Nations, or some other benevolent authority, provides the peasants in some depressed countryside with equipment and materials to build their own houses. The peasants give their work free, and with the help of the machines and materials they have been given, they improve their own condition.

13. The trouble with this system is that the Self-Help lasts just as long as the Aid does. The peasants learn how to work a cement-mixer, or how to fit up a prefabricated roof, but as soon as the free materials stop arriving, the peasants are as badly off as ever - except, of course, for the buildings they have already got. The point is that they cannot employ the skills they have learnt because they cannot afford the materials.

14. A further danger is that they may even lose the crafts they already possess, that enable them to make use of their own native materials. This may happen either by the traditional craftsman's deliberate rejection of his old methods; out of mistaken admiration for the imagined superiority of the alien methods; or, more ironically, by the alien method driving the traditional craftsman out of his job, taking away his work and chasing him into some other employment. Then, when the brief period of artificial construction is over, and the expensive machinery breaks down and the supply of foreign materials dries up, there is nobody left to build in the old way.

15. Aided Self-Help, in fact, merely succeeds in giving the local craftsmen an illusory feeling of progress and superiority, while tempting them into a sophisticated trade that will inevitably be shut to them a short time later. Either they become zealous advocates of the new methods (plus royalist que le roi) and despise their old skills, or they are driven away to become farm-workers. In either case their craft is destroyed.

16. It sometimes seems as if people in large clean offices or large clean universities in nice progressive countries are offended by the existence of poverty and squalor among millions in less fortunate countries. They cannot permit this eyesore - or mindsore - to exist. It is like an unwholesome beggar at their gate, and they want to get rid of it as fast as possible. How does the rich man dispose of the beggar? He sends out half-a-crown to buy himself peace of mind - or, more effectively, he builds a workhouse and legislates the beggar inside. The workhouse solution is perhaps discredited in the parish, but in international affairs it is still canvassed, in the shape - so I sometimes think - of Aided Self-Help. "Send out a million pre-fabricated houses". "Give them twenty shiploads of cement". "Give him sixpence to go away". "What a dreadful smell - give them some drains". "Well, at least they'll be better off in barracks than in those frightful hovels they've got now".

17. They wont! There is more beauty, and more self-respect, in the shanties put up by the refugees round Gaza, than in any of the dreary model settlements erected by benevolent foreign bodies, while in Nubia each peasant lives in his own airy palace like a lord. If only Aided Self-Help really achieved that! If only the Aiders would recognize what the peasant at his best can do, and would direct their aid to helping him realize his own creative abilities, then the plight of Egypt's peasants might not only be alleviated, but made the occasion for an architecture that would win the admiration of the world.

18. The two most frequently suggested systems of executing large-scale plans - the contract system and the system of Aided Self-Help - cannot cope with a problem the size of Egypt's. For the same reason certain other solutions - for example, the use of the Army or of volunteer bands of students, or even of forced labour - will not work. If the peasant has his village built for him, as a kind of charity, then he will not gain the skill and experience that he would if he built it himself, and when the Army, or whatever it is, has gone home, and the buildings in the course of time begin to deteriorate, the villager will not be able to repair them. It is exactly as if a man who wanted a garden went to

a shop and got a dozen horticultural experts to come and make him a garden one week-end. It would be very nice for a week, but the man would lack the skill, and even perhaps the impulse, to keep it in good order - it would probably be too big or too exotic for him to manage anyway - and before long his garden would become a wilderness. If, on the other hand, he had made it with his own hands in his own time, he would understand every bit of it and be well able to keep it attractive.

19. If the system of Aided Self-Help is to be successful, then the following conditions must be satisfied:

1. The materials given to the peasants must be cheap; cheap enough for the peasants to buy or for the government to give away free.

2. The materials given should be such as the peasants will be able to obtain for themselves without governmental help when the scheme comes to an end. That means, in practice that they must be common local materials.

3. The materials should not need skilled labour to handle them, beyond what the peasants themselves can afford to engage: no more than, say, a village mason or carpenter. The materials should be such that most of the work can be done by unsupervised labour.

20. In brief, Aided Self-Help must aid peasants to build in local, virtually costless, materials, using skills which they themselves already have or can easily acquire. Above all, materials such as steel or concrete - or even timber - which nearly always have to be imported, should be regarded with the utmost suspicion when it is proposed to hand them out to help peasants build their houses. Only when the country itself is producing these materials cheaply enough, and the inhabitants are earning enough money to buy them, are they permissible in national rehousing schemes.

21. <u>The Building Nucleus</u>. There is another system which has been used in some places, though not widely in Egypt. This is the "Nucleus" system, in which the Planning Authority designs one or two standard houses and builds <u>a small part</u> of each house, leaving the occupier to build the rest himself. The Government-built bit is the nucleus, and the occupier's contribution forms the rest of the organism. Unfortunately, since the nucleus is usually built of concrete or baked brick,

the peasant cannot afford to carry on in the same material, and sticks on accretions in mud-brick. Thus there is no continuity or consonance between the two parts of the building, and the Government's contribution scarcely deserves the name of "nucleus". Like other forms of Aid from Above, the "nucleus" system does not stimulate local crafts nor prepare the peasants to build for themselves.

22. The Cooperative System. Only when the technicians - the architects and engineers charged with the responsibility of rehousing a peasant population - acknowledge that a vigorous and self-perpetuating tradition of building can only arise from the entusiasm of the peasants themselves, and that such enthusiasm can only spring up if the peasants see that they can really build good houses themselves for next to nothing: only then will any national housing scheme in any underdeveloped country stand a chance of success.

23. If you want a flower, you don't try and make it with bits of wood and glue, but you devote your labour and intelligence instead to preparing the ground, then you put a seed in and let it grow. In the same way, to make use of the natural desire of the villager to build, we must apply ourselves to preparing the ground, to creating an atmosphere or social climate in which building will flourish, and we must not waste our energy on the construction of buildings which, however smart or striking they may be, will be as sterile and unproductive as artificial flowers. Indeed, the seeds are already there in the ground, germinated and ready to push up to the surface; the plant has adapted itself over long centuries to the land, and will flower abundantly. We need only give it a little encouragement - a spot of weeding, a little hoeing, perhaps a sprinkle from the watering-can. The least assistance from science, the smallest encouragement from the Government, will, if intelligently given, be enough to bring about a rebirth of peasant initiative in building that will be infinitely more powerful than any ready-made Government building program can be.

24. We already know that the materials exist and are cheap; we already know the technique of using them. What can the peasants themselves teach us about organizing the work? How do the villages, in those places still untouched by the commercial building contractor, arrange their building activities?

25. They cooperate. When a new house is to be built in a village, everyone is expected to lend a hand. Many people help in the work, and the house is soon finished. None of these helpful neighbours is paid.

The only return expected by a man who puts in a day building a fellow-villager's house is that the fellow-villager will do the same for him one day. Building thus becomes a communal activity, like harvesting, like dealing with a fire, like a wedding or funeral. The villagers in Nubia seem to work together to help each other as naturally and with as little direction or supervision as ants or bees.

26. The Cooperative system, however, can only work in this traditional way when it is dealing with traditional problems and when the society is truly traditional itself. A dozen new houses a year do not put a great strain upon the labour resources of a village. There is still time to attend to the fields and to all the other affairs of life. Similarly, when a man lives on what he grows, and money is a rare commodity; when he has not been tempted with the knowledge of what money can buy; he is quite willing to give up his time to building a house or two. No one has ever told him "time is money". But when a whole new village is to be built, then building takes up a disproportionate amount of the community's time; and when a man becomes accustomed to work for a wage, he is unwilling to do the same work for nothing.

27. Nonetheless, if a system of Cooperative building can be made to work, it has enormous advantages over any system employing professional builders. First and foremost, a village built by its own inhabitants is a living organism, capable of growth and of continuing life, whereas a village built by hired professionals must be a dead thing that starts to fall to pieces the day after the builders leave. Secondly, a cooperatively built village is much cheaper than one built by hired labour - in fact, it is the only kind of village cheap enough for a country like Egypt to afford in large numbers.

28. If the traditional cooperative system can be made to work under non-traditional conditions, then it can clearly be expanded and applied to a mass housing program.

29. The basic motive in the voluntary donation of time and labour in the cooperative system is the desire to receive similar help oneself: "Do-as-you-would-be-done-by", in fact. Every neighbour, by helping build a house, establishes a right to receive help himself, opens an account in a kind of labour-bank. If this principle is recognized, and if the exact amount of work to a man's credit can be calculated and recorded, then the cooperative system will begin to appeal to even the most commercially-minded peasant.

30. Obviously, everyone would like a new house, if it is bigger, cleaner and more beautiful than his existing one. Anyone would be willing to build such a house for himself if shown how. The snag is that a house is essentially a communal production: one man cannot build one house, but a hundred men can easily build a hundred houses. "All right", says the peasant "I want a house, so let's build it - but why should I build a house for Ahmed?" Only if the peasant's own contribution to the house can be accurately and impartially measured, and recorded as a loan to society, which society will repay in the shape of a house, can the suspicious peasant be persuaded to join in a scheme of communal cooperative building.

31. In order to measure the work lent to the community by any individual villager, and to state this loan in terms of the building owed to him by the community, it is necessary to know in the minutest detail two things: one, how many hours useful work any given worker has done, and, two, how many man-hours of work have gone into any component of a house.

Ionides, M. G.

THE EKISTIC APPROACH TO DOMESTIC WATER SUPPLIES FOR VILLAGES

A. THE CONTRAST BETWEEN THE "ECONOMIC" AND THE "EKISTIC" APPROACH

1. The economic and the ekistic approach may be contrasted in the following way. The economic approach starts by finding out how much money is available, and how this may best be spent to provide village water-works. Ekistically, we start by considering the manpower already present in a village, its skills and the materials lying ready to hand. We study how these can be best joined together to provide a pure water supply.

2. Let us pursue the economic approach further. A water-works consultant charged with the task of producing a programme for a given number of villages, with a given budget, will naturally proceed along the lines in which he is trained and accustomed.

3. Thus he will design the simplest possible plant which can be prefabricated in factories, to a limited range of standard types. He will then organise a programme of installation. He will minimise on-site labour to the greatest possible extent. Teams under highly-skilled and highly-trained supervision will arrive at the villages, install the plant and go away. The guiding principles he will adopt will be as follows:

(a) Minimise the labour content in manufacture.

(b) Minimise on-site work.

(c) Maximise mechanisation and prefabrication.

(d) Maximise hydraulic efficiency.

4. The money spent locally, in the village, will be at the absolute minimum. The use of local materials and local skills will also be at the absolute minimum. The money spent in factories and on highly-skilled personnel, whether in the country itself or in a more industrial country, will be at the maximum proportion.

5. The ekistic approach starts in the exact opposite direction. The ekistic engineer aims at the following:

(a) Minimise the content of items which have to be bought for each

(b) Minimise the content of highly-skilled labour.

(c) Maximise on-site construction and use of local materials.

(d) Maximise local labour content.

6. The difference can be seen in another way. The economic approach requires the people of the country to put their labour into productive works of some kind which will earn cash, and then to use that cash to employ highly-skilled and highly-paid men to make a water-works for them. But cash is exactly what they lack. The ekistic argument is that they should save their cash for things they cannot do themselves, and use their own direct labour and local materials wherever possible. Thus, by saving expenditure of cash, they are in effect earning it. They do not have capital in money, but they have capital in the form of labour, and the ekistic engineer plans ways of converting this latent capital into actual capital in the form of physical assets.

B. THE PRINCIPLES AND DEFINITIONS OF "EKISTIC EFFICIENCY"

7. We can envisage an "ekistic efficiency" index which we may call "K".

(a) Let "L" be the money value of everything that is contributed from within the village itself in the form of labour, materials and services. The labour cost may be the actual monetary cost where money passes, or the money equivalent. If money passes, it is no odds whether it is the villager's or money from the Government; it is the labour-process itself, being strictly local to the village, that we are measuring. In the same way, the value of the materials is the money equivalent of the labour the villagers themselves contribute in winning, processing and carrying to the actual construction site. Services include any other village activities which contribute, turned into equivalent money values.

(b) Let "E" be the money value of everything concerned with the job which does not begin and end in the village; such as cost

of technical supervision, transport other than that originating in the village, materials, tools, etc., which have to be bought for cash from sources outside the village.

(c) Then the "ekistic" efficiency index is

$$K = \frac{L}{L+E} \times 100\%$$

We can illustrate the significance by a reduction ad absurdum at two opposed extremes:

(i) A completely prefabricated plant brought to site by lorry, together with trained team who install it and depart. K = 0%.

(ii) Villagers listen to detailed instructions by radio which tell them how to do the entire job for themselves out of exclusively local materials, labour and skill. K = 100%.

8. We do not argue that a design giving 100% efficiency is necessarily desirable in practice. For example, if it requires an impracticable work-load of local labour, we must retreat from 100%; or, if the resulting quality of water is too low, we must also retreat.

9. What we do say is that the starting point of investigation should be to strive for technically satisfactory designs which will meet the following conditions:

(a) 100% ekistic efficiency.

(b) 100% pure water supply.

(c) Maximum degree of standardisation in design and processes of construction.

10. Certain specific corollaries flow from these conditions:

(d) Construction processes must be 100% within the skill and comprehension of the villagers.

(e) The hydraulic efficiency of the processing of the water supply is completely subordinated to the other requirements. It is the last factor to consider, whereas by the economic approach it is the first.

11. If we can evolve a design giving 100% ekistic efficiency, then we may retreat to a lower value for certain specific reasons:

(a) To reduce the labour load on the village.

(b) To increase hydraulic efficiency.

(c) To meet inadequacy in the resulting quality of water.

(d) To add refinements beyond the plain availability of pure water, such as devices for lifting water, tanks, pipes for distribution, etc.

12. Every retreat from 100% ekistic efficiency carries with it a money penalty in the sense either:

(a) Money already possessed by the villagers must be spent outside the village, i.e. leave the local village economy, or

(b) Money must be spent by Government.

13. We have examined these theoretical considerations in the abstract, i.e. without reference to any specific designs, because it is essential to adapt our minds to the science of the ekistic approach in the first instance. We must on no account start with our minds occupied with the image of a factory-made plant and then look for ways of increasing it. On the contrary, we must start with K = 100% and then consider retreating from it to the extent that the governing conditions of paras. 9 and 10 compel us to do so, or to the extent that the availability of money make it possible to purchase improvement at the expense of ekistic efficiency.

14. But we must always bear in mind that we are not concerned with "improvisations" in any sense at all. We have to meet the following conditions:

(a) Standardisation of design and specification for all on-site work.

(b) Standardisation of all additional items of materials or equipment which have to be made, whether by hand of the villagers or in factories for delivery to site.

(c) Standardisation of the processes of construction and installation.

(d) Standardisation of the tools of construction.

(e) Hence, standardisation of training courses for engineers and foremen.

15. All this will in due course lead us to a precise programme of survey, experiment and design. We shall need to break down the various types of prime water-source available to villages, e.g. springs, streams, rivers, canals, irrigation ditches, wells, and consider each in turn. We shall have to break down the elements of the processes into their natural divisions, e.g. filtration, purification, storage, distribution, lifting.

16. But first of all, we will confine ourselves to the key element of filtration. We choose one particular type of source, i.e. an irrigation ditch (where the quality of the water is likely to be worst) and we try to establish, if we can, the ultimate starting point. That is, a design which will meet the conditions of paras. 9 and 10 above; what we may call, for short, the 100% ekistically efficient design. We pass from the general to the particular.

C. A PARTICULAR CASE FOR TECHNICAL EXAMINATION

17. A village in an alluvial irrigated plain gets its water from an irrigation ditch with a bed-width of (say) one metre. The sub-soil water-table is a few metres below ground level and the water is saline. The population is, say, 200 all told. At the present time, the villagers draw their water from the channel by hand. After the water-works has been constructed, they will still draw their water by hand; for, since we are going for K = 100%, we must spend no cash to buy a pump. They will take the same amount as before, carry it the same distance, with the same trouble to themselves. The essential difference is that instead of drawing clouded, polluted water, they will now draw clear, bacteriologically pure water. We must look for a design which satisfies the conditions of paras. 9 and 10, which we have defined as K = 100%.

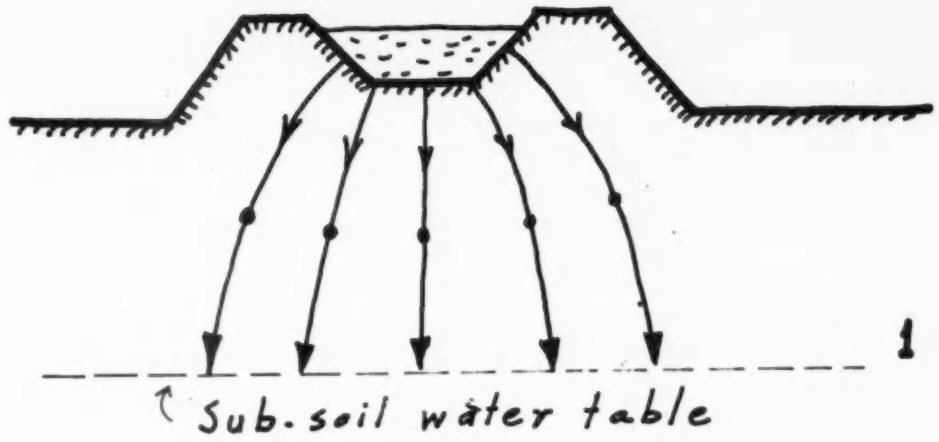
18. Figure 1 illustrates a cross-section of the channel we have in mind. The channel is constructed of alluvium. There is a constant seepage of water from the channel, down through the alluvium, which eventually joints the sub-soil water-table. This is indicated by the flow-lines. We shall come later to the question of the rate at which the water seeps down. For the moment, we need only consider the fact that there is a flow, however small it may be.

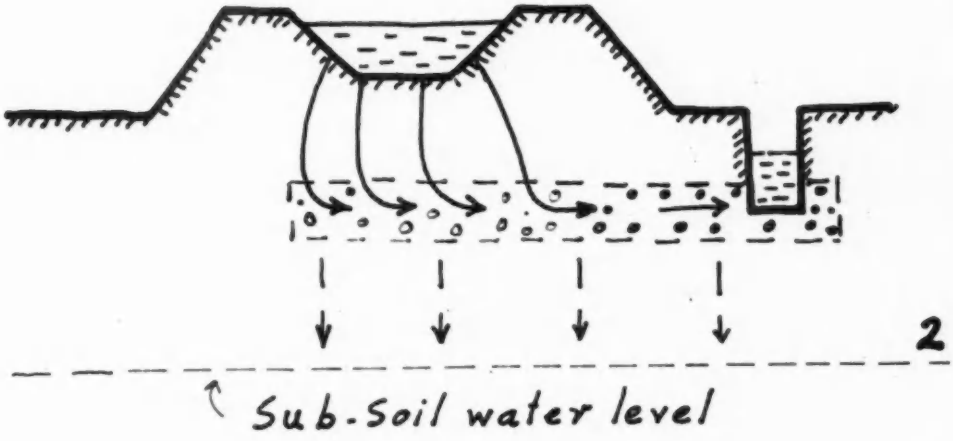
19. In the process of percolation from the channel to the water-table, the water is clarified. Its silt load is filtered out. It is also known that the process of gravity filtration - provided it is slow enough - improves the bacteriological quality of the water. Indeed, some experts claim that a really slow rate of filtration will give bacteriologically pure water. For example, one authority informs us that bacteriologically pure water will be provided by a rate of filtration of 2 gallons per square foot per hour through a bed of about 3 feet of sand.

20. There are probably very few irrigation channels from which percolation goes down to the water-table at anything like such a high rate. A rate of percolation loss of 1 cubic metre a day per square metre of surface water area in the channel is high. The rate of percolation through a sand filter bed; and if the sand gives bacterial purity, it would seem reasonable to suppose that the alluvium may also do so. However, this is a question that must be settled by actual experiment. For the moment, all we need to say that the natural rate of percolation from an irrigation channel into the sub-soil is likely to be so slow that bacteriological purity may well be achieved.

21. Going back to Figure 1 therefore, there is a point down the length of each flow-line, indicated by a blob, where the water is both clear and pure. Since these are natural hydraulic flow-lines, the whole water content of each flow-tube derives, by definition, from the water in the channel. By definition of what a flow-line is, there can be no lateral intrusion of water, e.g. by seepage from the ground surface, which might bring polluted water into the flow-tube.

22. It follows that if we can collect and abstract the seepage water from the appropriate depth between the bed of the channel and the sub-soil water-table, we shall have a source of water which is certainly clear, almost certainly bacterially improved, and probably bacterially pure.


1
Sub. soil water table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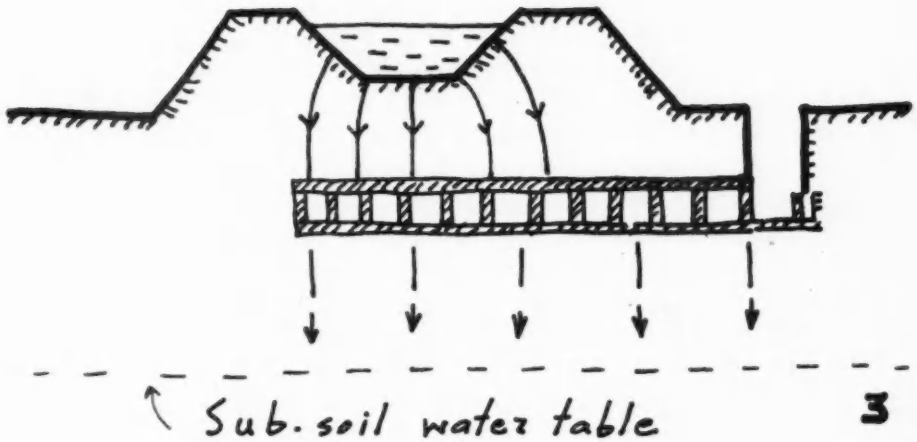
Sub. Soil water level


3
Sub. soil water table

23. Let us now assume that there is a source of shingle or gravel available to the village. That is to say, by the use of their own labour and ability to dig and transport shingle to the site, they can get it without expending cash. (If there is no such source, nor any other material which can be used to satisfy K = 100%, then K = 100% is impossible. The assumption we have made as the availability is therefore implicit in the test case we are considering). They may now excavate down below the bed of the channel and insert a water-bearing stratum of shingle beneath it, as illustrated in Figure 2.

24. We do not yet know what the rate of percolation is. We can, however, state with certainty that if the villagers sink a permeable stratum along a sufficient axial length of the channel, they will get as much water as they need. They can lead the permeable stratum out to the side of the channel, as indicated in Figure 2, and provide a shaft through which they can draw water by hand. (Whether all this will require so much labour that it is impractical is another matter; here we are striving to establish that K = 100% is technically and hydraulically possible.

25. Let us now examine requirements and rates of flow. A village of 200 people may need a daily supply of, say, 10 gallons a head. That is, 20 cubic metres a day approximately. Let us assume that the alluvium is such that the rate of filtration is only 0.1 cubic metre per day per square metre. To yield 20 cubic metres a day, we should need to tap the flow from a bed area of 200 square metres. The area of shingle stratum required to do this might be two or three times as great, say, 300 square metres. If the shingle stratum is half a metre thick, it would require 150 cubic metres of shingle.

26. The physical measure of the job would thus be to excavate something like 500 cubic metres of alluvium, lay 150 cubic metres of shingle, re-fill and re-form the channel. At a very rough estimate, a gang of 20 or 30 men working for two or three weeks would be able to do this.

27. This is certainly a considerable work load for a village of 200 people all told. But it is far too early in our examination to pursue the point further. What we have established is that at a rate of natural percolation which is not uncommon in irrigation ditches, a solution for K = 100% seems within the bounds of technical possibility.

28. This kind of work, it should be noted, makes fullest use of the

available skill in a village. Peasants in irrigated areas have it in their blood to excavate earth in relation to water levels. A man with the inherent skill of a bricklayer - or even less - could easily plan to set out such a job by eye, judging his distances by pacing. Incidentally, it is worth noting that the peasant of the village would take to this work far more naturally and easily than (say) a labourer from England. Supervision by eye and rough measurement would be far more easily done by a foreman of the country than by (say) and English foreman, who is accustomed to use far more elaborate techniques and would be lost without them.

29. There are of course other ways of creating a submerged permeable stratum, for example, by bricks laid in the dry as shown in Figure 3. It may be that moulds for local burning of specially designed sections could be supplied. Or possibly some kind of moulded sections for stabilised alluvium might succeed. We note these possibilities, but do not pursue them here.

30. It looks, therefore, as if a solution with one hundred per cent ekistic efficiency, satisfying the requirements of paras. 9 and 10, may be a possibility. But in fact we are probably setting the case in too extreme a form. In fact, if shingle is available, sand is likely too. We may then proceed to the solution indicated in Figure 4. This is simply the construction of a slow sand filter, with shingle beneath it, or some other form of permeable stratum, in the bed of the channel. The rate of filtration will now be much greater. Consequently, the labour content will be much less.

31. Certainly, the surface of the sand filter will become clogged with silt. But since we know that there is a flow by percolation even through the bed of a canal which is completely composed of alluvium, we may be fairly certain (if not absolutely certain) that to substitute a bed of sand for a bed of alluvium will improve the rate. No doubt, the rate will be far slower than could be tolerated in a full-scale water-works in a town or city. But the limits imposed in such cases derive from economic considerations such as the value of land, labour, etc. Looked at ekistically, we can afford a very low hydraulic efficiency for a sand filter, if this can be compensated by ability to achieve the result without the expenditure of cash.

32. A gravity sand filter 3 feet deep will yield approximately 2.4 cubic metres per square metre of surface per day, if its surface is

kept clean. This is 24 times as great as the rate of 0.1 for which we have established a possibility of K = 100%. The labour content with a sand bed will be up to 24 times less.

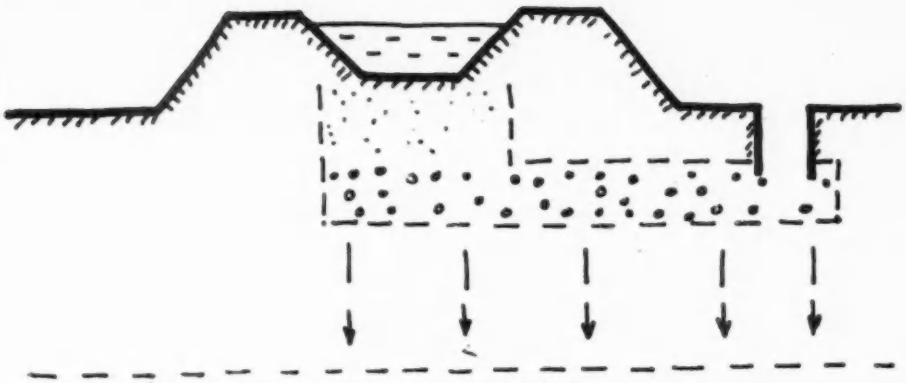
D. SOME DEPARTURES FROM K = 100%

33. It will be noted that in Figures 2, 3 and 4 that there are dotted lines showing a flow from beneath the permeable stratum into the sub-soil water level. It is difficult to see how a solution on K = 100% can avoid this. Technically, it can be avoided, as illustrated in Figures 4, 5 and 6, where the thick line under the permeable stratum indicates an impermeable bed or membrane. If the village has a source of lime or hydraulic cementing material, this can no doubt be achieved, within K = 100%, by using it to lay an impervious bed beneath the stratum. If not, then we must retreat from a K = 100% by importing material, for which cash has to be paid, to achieve the same result.

34. This may be done by importing cement to make a cement concrete bed, or to cement a lower layer of bricks. Or it might be done by some form of thin impervious membrane, such as bituminised fabric, or even a metallic sheet or foil, for example, aluminium (we are considering technicalities, not costs at this stage). A subterranean membrane of this kind will carry very little stress. It does not have to be absolutely water-tight, in the same way that a tank above ground level needs to be water-tight. Such leakage as there is, is not "free" in the sense that leakage from a tank above surface is free; it enters the sub-soil and the rate of flow is governed by the permeability of the soil into which it flows.

35. So far, we have been assuming that the submerged filter delivers into a reservoir or well of some kind from which the villagers draw water by hand. At the cost of ekistic efficiency, we can improve on this by providing a hand-pump, as illustrated in Figure 8.

36. Since there is a flow of water in the channel, we may go a step further by installing a water-wheel, as illustrated in Figure 9. This will enable us to deliver water into a reservoir set above ground level, as shown in Figure 10. The villagers may now draw water direct from this reservoir, through faucets, without the need for pumping by hand. On the other hand, ekistic efficiency has now gone down, because the water-wheel and pump and reservoir will require further expenditure of cash.



Sub. soil water table

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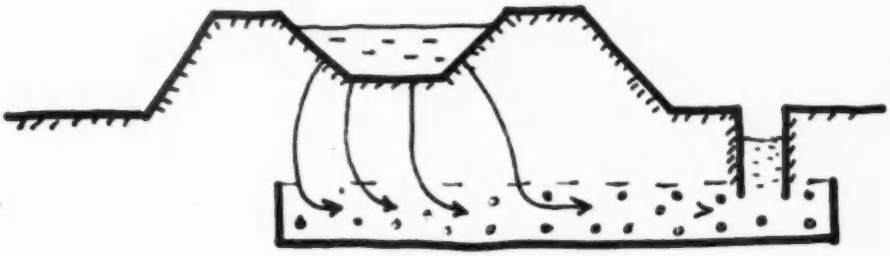
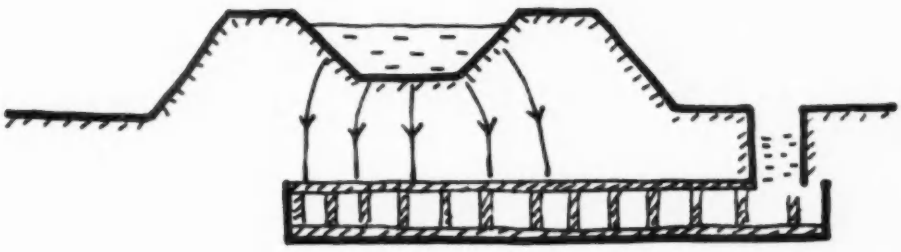


Sub. Soil water level

5



6

Sub. soil water table

37. At the cost of a further retreat from K = 100%, we may proceed to a pipe delivery to a point in the village, as illustrated in Figure 11.

38. We may run into the difficulty that the irrigation channel only runs full for a week at a time, one week on, one week off - a weekly rotation. During the "off" week there will be a trickle, but the percolation rate will decline. A reservoir will be needed.

39. Figure 12 illustreates a possible solution which may satisfy K = 100% if the villagers command a hydraulically satisfactory cementing material. It is hydraulically inefficient, because the sheer volume of material required to provide a given aggregate of voids is far greater than in the case of a properly constructed reservoir. But it has the merit of extreme constructional simplicity. No labour skilled in hydraulic masonry or concrete work is required. There is no problem of providing a roof, which is a considerable item in a normal reservoir. A reservoir of this kind can be as wide and shallow as we like - so far as the "filler" is concerned the form makes no odds.

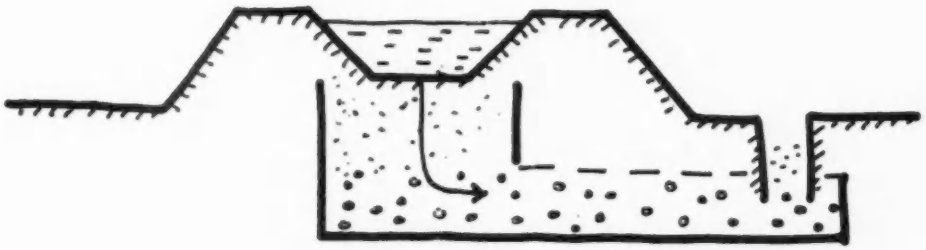
40. Consider, for example, a reservoir of this kind to contain, say, 100 cubic metres of water, enough to carry the village over the "off" week, together with the reduced yield of the filter. Suppose the "filler" has a void-ration of 1:3, so that we need 300 cubic metres. If the plan-form is a square 20m x 20m, with an area of 400 square metres, the depth must be 0.75 metres. The superficial area of impervious layer or membrane will be 860 square metres. It is worth investigating.

E. ROUND-UP AND A LOOK AHEAD

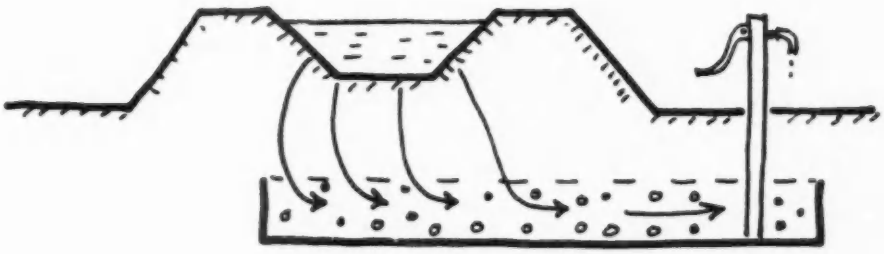
41. We have established the basis of ekistic theory in relation to village water works which sets our minds in tune for detailed technical examination.

42. We have made a general hydraulic and constructional examination of one specific type of source for village supply.

43. We have established at least the probability of a solution at very nearly K = 100%, but have retreated from the limit in several technical points for purposes of further examination.



Sub. soil water table 7



Sub. soil water level 8

44. We are now in a position to specify certain practical lines of advance, which are as follows:

(a) Further enquiries and desk-work relating to

(i) Compilation and analysis of recorded data on the hydraulic and filtration aspects.

(ii) Ditto on methods of using local materials of all kinds to fulfil the structural requirements.

(iii) Ditto on various ways of making impervious beds or membranes; chemicals for water-proofing or stabilising, bituminised fabrics or papers, metallic membranes, plastic sheets.

(b) Following this, practical tests in an experimental yard and model laboratory. These should themselves be planned for utmost simplicity and cheapness.

(c) Extend theoretical analysis to other typical sources, e.g. large, canals, rivers, mountain streams, springs, wells.

(d) Examine ekistic approach to various means of lifting and pumping water by manpower, water power, wind power and mechanical power.

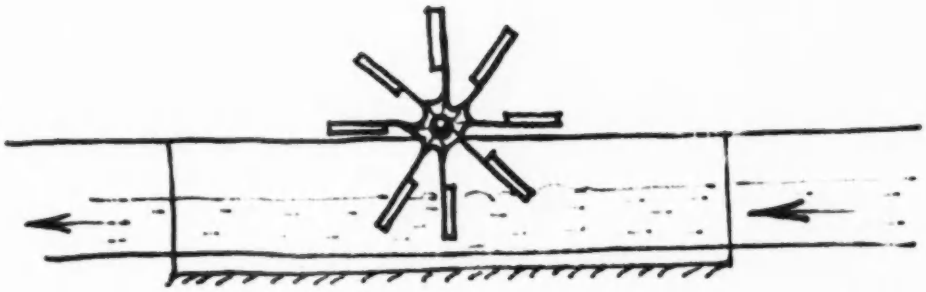
(e) Extend ekistic analysis to elevated tanks and pipes for deliver.

(f) Extend analysis to other engineering works apart from water-supply, based on the village, e.g. roads and culverts, drains, small irrigation systems.

F. IMMEDIATE STEPS

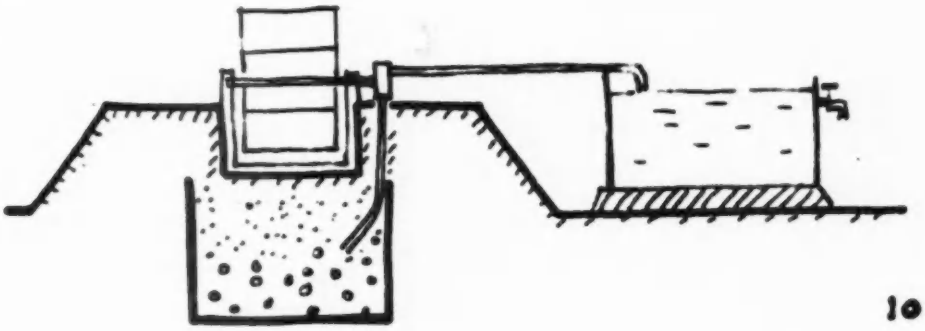
45. We see an immediate task in following up the desk-work outlined in para. 44(a) above, whilst at the same time pushing our thoughts further on the items in paras. 44(b) to (f).

46. Of the three items under para. 44(a), No. (i) is probably best done in London. No. (iii) calls for enquiries from top-level, industrial



Water-wheel set in rectangular flume

9



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concerns and their research men; this can be done in London. No. (ii) is best done in Athens.

47. As regards methods of using local materials to fulfil structural requirements, desk-work might be limited at present to the following questions:

(a) What materials and forms can be envisaged for the "reservoir" element in a subterranean filter-stratum or a subterranean reservoir; e.g. shingle, bricks laid in various honeycomb forms, special burnt or moulded sections to provide maximum void ratio, etc.

(b) Cost in labour for various geometric forms and types of construction.

(c) Compare a reservoir of (say) 200 cubic metres water-capacity made as above with similar capacity constructed traditionally of brick or concrete with roof. Make the comparison on the basis of a normal contract job and also on the ekistic principle.

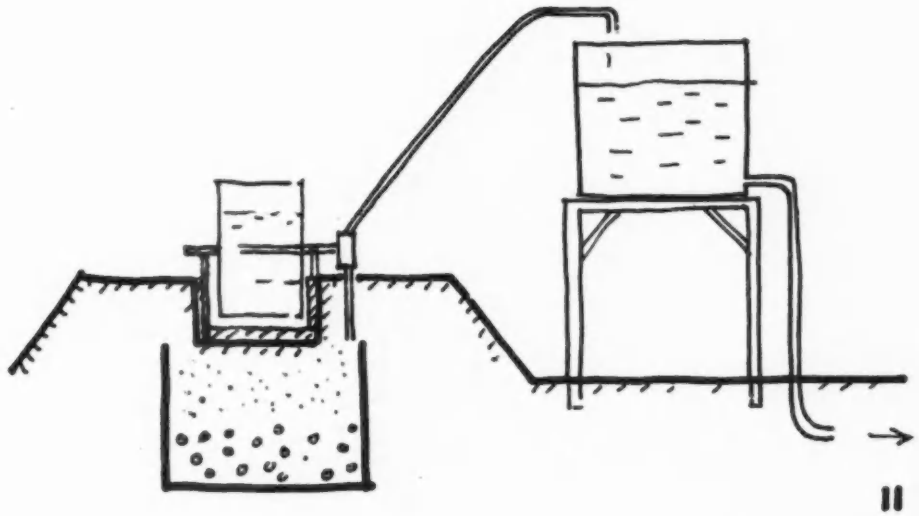
G. DEVELOPMENT OF THE THEORY

48. In this study we have confined ourselves to the smallest ekistic unit, the village. When K = 100%, no values in terms of goods or services cross into the "ekistic boundary" from outside.

49. But the ekistic boundary is not the territorial boundary of the village. For example, if the villagers go ten kilometres away with their donkeys to get sand, the operation is nonetheless within the ekistic boundary.

50. Beyond this is the ekistic boundary of the district. This may provide the basis for an industrial plant, such as a kiln and yard for making special sections. This plant is itself a goal for the ekistic engineer's techniques. Where we have to retreat from K = 100% in such a plant, e.g. by providing an oil-firing unit, this must itself have special study with the best industrial advice. Beyond the district there are the ekistic boundaries of the province and then the state.

51. As we go upwards from the base of the ekistic pyramid we apply the

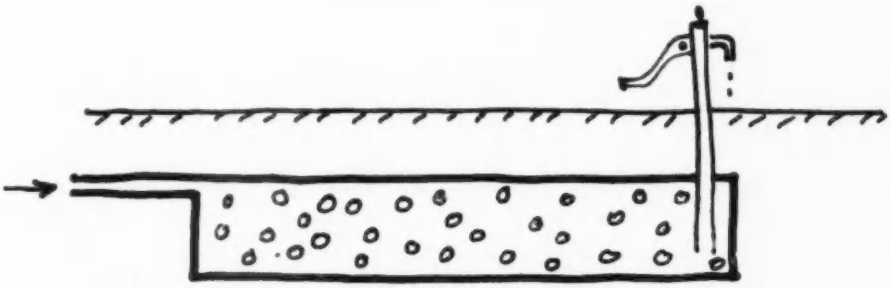


11

same approach. But the higher we go, the local resources in skill, materials and the means of production multiply in scope and quality. When we are working within the national ekistic boundaries (and to a lesser extent the province and the district), we shall find ourselves dealing with industrial processes which are familiar enough. Nevertheless, the ekistic approach will still be needed.

52. In this way, the ekistic approach carries us all the way from the simplest skills and materials in the village, right up to the highest industrial processes. But there is one feature in common from one extreme to the other; standardisation of designs, specifications, constructional methods and training in execution, based upon the highest degree of technical application. The basic principle is to combine all that is best in existing resources of skill, labour and materials with all that is best in the sciences and techniques of the industrial world. We seek the best amalgam of all that is best, from the village itself, right up the technical scale to the pinnacles of technological knowledge and processes.

53. The idea of "industrialisation" also runs through from the technical base to the technical apex. Constructional work in the villages on a basis of standardisation is a form of constructional industry. At each stage up the pyramid, mass or quantity requirements of fabricated materials, equipment, tools and plant, create the need for local industries, centering on the district, province, and finally the state.



The water-reservoir capacity is the aggregate of voids in the "filler", which is of shingle or some honey-comb construction. The water-proof lining or membrane is thus physically supported on both sides and can therefore be thin.

Lining might be:

(a) Brick in mortar
(c) Concrete
(d) Puddled clay
(e) Ditto with some water-proofing chemical
(f) Bitumen layer
(g) Bitumenised fabric
(h) Aluminium sheet or foil
(i) Plastic sheet
(k) ?
(l) ?

Tyrwhitt, Jaqueline

PRELIMINARY RESEARCH INTO USES OF HOUSE PLOTS BY NEW REGIONAL PLANNING SCHOOL IN INDONESIA

1. I have been asked to write something about the new school of Regional & City Planning which opened in September 1959 as a division of the Bandung Institute of Technology with a first enrolment of 37 students. The school has been founded with the joint support of the United Nations Technical Assistance Board, the Government of Indonesia and the Department of City & Regional Planning, Harvard University. At least one member of this faculty will be working at the school over the next few years - at present I am there.

2. It is far too early to give any realistic description of the school for, although its 4½ year curriculum has been settled and its faculty of twelve specialist planners has been engaged, only two of these are already working with the students: the rest are completing their advanced studies in various parts of the world. Only in 1962 when they are back and when the final 2½ year course is fully in being can any fair assessment begin to be made. The school has three basic aims: to provide a general training in regional and city planning for students from Indonesia; to undertake advanced research studies; eventually to act as a centre for S.E. Asia in the field of advanced training and research in regional planning. These last two aims are still unfulfilled, though a preliminary program of research projects has already been drawn up with the Indonesian National Planning Council, which will absorb the energies of the new Indonesian faculty after 1962. Implementation of the final aim may start even in 1961, with the first year of the advanced curriculum. This will be conducted entirely in English and will be open to direct enrolment by students from other countries who already possess a degree in an allied field.

3. However, all this is in the future. At present the first enrolments of students are only halfway through their second term.. During these first two terms most of the students' time is taken up with the basic studies required by the Bandung Institute of Technology, (established shortly after the first world war to give degrees of an identical standing as those at the University of Delft). However two introductory lecture courses and two studio courses in planning are included and, in their second term, the students undertake field surveys of nearby "desas", the basic units of Indonesian rural society.

These are large villages, or small towns which, because of Indonesia's ancient culture and dependence upon rice cultivation with its demands upon communal controls and communal action, have a long tradition of self-government.

4. The students made a general field survey of two desas in the vicinity of Bandung, each with a population of around 5000 people. They covered the present use, method of construction and condition of repair of every structure in each desa. They also made a special study of the present use made of many of the house plots. This is intended to form a basis for the determination of plot sizes in their new plans for these areas.

5. Simply because such a study is not known to have been attempted before it is thought that the results of this small investigation may be of some general interest.

6. It has now generally been accepted that the most effective and successful programs of housing and community planning for towns and villages in rural areas concentrate upon decision as to areas of future land use, communications, the provision of adequate social facilities and the site planning of the residential areas; the assumption being that the construction of all houses will be undertaken by the people themselves.

7. This general program is particularly relevant in the case of West Java with its age-old traditions of independent rural government and of "gotong rojong", or organized cooperative work upon some desired project. Here the framework of what can be called the normal rural house is of wood posts or bamboo. The floor is raised upon short stone pillars; the walls are of woven bamboo mats and the pitched roof is of red tiles, with deeply projecting eaves to throw the tropical rainfall well clean of the house. Usually this heavy roof which is almost square on plan, also covers two open verandas at opposite corners of the house. The result is an efficient and beautifully proportioned dwelling admirably adapted to climatic and social needs: the front verandah serves as the separate guest room for this Moslem country.

8. The problem of site planning lies therefore in the size and disposition of the house plots and, to obtain some first hand data upon this, the students made a field survey of the uses made at present of the land in front, at the sides and at the back of a number of houses in two very different "desas".

9. One of the desa selected for this study was Tjimalaka, a long settled village with its traditional "alun-alun": an open square green surrounded by mosque, schools, and "balai desa" or public meeting hall. In this village, located amid fertile rice fields, the detailed use of 426 house plots were recorded.

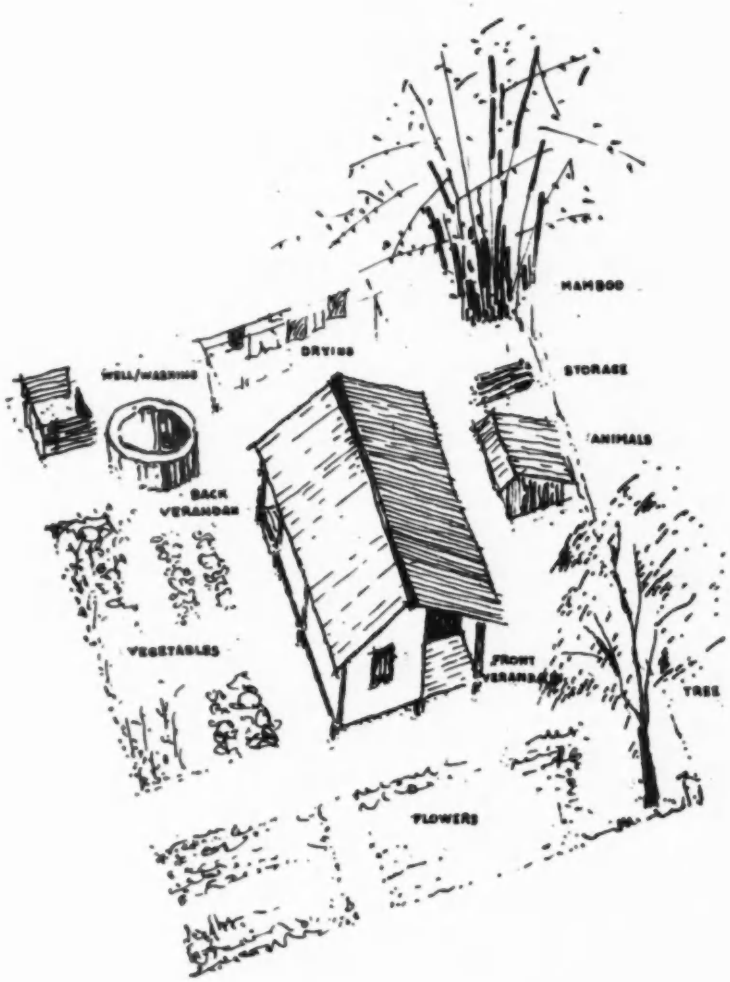
10. The other desa was Tagogapoe, a roadside settlement which had sprung up along a narrow valley flanked by two railroads. The long string of houses clinging to one side of the valley is interspersed with five lime kilns which make skilful use of the steep slope of the limestone hills. Raw lumps of stone are tipped down the tall kiln towers which spew out the powered lime along the roadside. In Tagogapoe 197 house plots were investigated and recorded.

11. The results of these field surveys were tabulated, mapped and analyzed by the students.

12. The following table gives the general findings:

TJIMALAKA	Vegetables	Flowers	Shade-tree	Well	Outhouse	Washing	Cooking	Worksite
Front	20.0	27.0	12.5	1.7	1.2	2.0	0.5	1.3
Sides	34.0	10.8	13.8	8.1	5.0	2.5	2.1	2.2
Back	20.0	1.2	5.7	14.2	6.8	2.5	7.4	0.5
426 TOTAL	74.0	39.0	32.0	24.0	13.0	7.0	11.0	4.0
TAGOGAPOE								
Front	11.7	18.7	11.3	0.5	2.1	0.6		4.5
Sides	22.5	7.3	7.1	1.5	8.7	5.3	4.2	4.0
Back	16.8		2.6	11.0	7.2	2.1	5.3	0.5
197 TOTAL	51.0	26.0	21.0	13.0	18.0	8.0	10.0	9.0

13. Vegetables. Vegetables are grown even on the steep limestone slopes of Tagogapoe by just over half the households 51% varying from 39% in a particularly densely packed kampong to 67% in a series of small settlements studding a switchback side road connecting the two railway stations. On the good land of Tjimalaka vegetables were grown by almost everyone except in the more crowded parts around the town center where the proportion dropped to 56% bringing the total average to 74%.



TYPICAL "DESA" IN VILLAGE

14. The most favored position for the vegetable plot was at the sides of the house and about two thirds of the plots in both desas were either at the sides or back, with the remaining third occupying the frong garden. This proportion remained fairly constant in the different areas.

15. Flowers. The good soil of Tjimalaka is condusive to gardening, and almost two fifths of the dwellings grow flowers around their houses - usually in the front garden. This proportion rises to 65% around the town center where it is presumably civic pride which indicates that flowers rather than vegetables should be grown. Even in Tagogapoe a quarter of the houses sport a flower patch (26%) rising to 30% along the main road - the equivalent in this roadside settlement of the center of Town.

16. Trees. Trees planted for their fruit or for their leaves (for wrapping) or for their shade - or for all three - are common. Bamboos, banana and papaya though not included in this category, are also frequent, the bamboo and banana usually in fairly dense groves between groups of houses, the papaya often grown along a boundary, as a kind of hedge. This category however, refer only to major trees such as the avocado pear, mango, rambutan, various types of "djambu", etc.

17. About a third of the households in Tjimalaka and a fifth of those in Tagogapoe had at least one largish tree usually at a front corner of the house - very seldom at the back.

18. Storage. Apart from growing plants, the most frequent use of outdoor space was for storage - usually of fuel. For no very clear reason the proportion in Tagogapoe was consistently around 25% and in Tjimalaka around 14%. In both places the sides of the house were the favored position, usually below the spreading eaves.

19. Wells. A quarter of the houses in Tjimalaka had their own well, the proportion being rather less along the roads (19%) and rather higher in the kampongs (31%). The lower proportion along the roads was probably due to the existence of a small canal which however could scarcely be used for drinking purposes. A fairly swiftly flowing river along the valley below Tagogapoe provides water for all the kampongs off the main road. Along the road the proportion of wells was 19%, as in Tjimalaka, but not for the same reason.

20. Wells are most usually sited at the back of the house but in Tjimalaka quite a few are at the sides. They are rarely found in the front garden.

21. Hut or Outhouse. Almost every fifth house in Tagogapoe and every seventh house in Tjimalaka had erected some kind of a shed in which they usually kept a goat, sometimes a buffalo. They were built either at the side or the back of the house, very seldom in frong and neither the proportion nor the position varied greatly from site to site.

22. Washing Place. A washing place or laundry place was something which varied considerably with the site. Along the main road 17% of the houses in Tjimalaka and 11% in Tagogapoe had outdoor provision for washing and laundry work - almost always at the side or back of the house. But in the kampongs these figures dropped to 2% in Tjimalaka and 3% in Tagogapoe.

23. Cooking. Outdoor cooking facilities seemed to vary with the site, though not consistently. In one kampong of Tjimalaka 30% of the households cooked out-of-doors and in one of the Tagogapoe kampongs a figure of 21% was recorded. But in another kampong of Tjimalaka there were only 6% and in the other Tagogapoe kampong area nil. This discrepancy was not related to the size of the house and was possibly caused by the presence or absence of back verandah. An attempt has been made to verify this but only the presence of a verandah was noted on the survey form, not its location. As in all but a very few cases every house possessed some sort of verandah somewhere no deductions can be drawn.

24. Along the roadside of each desa the overall figures were 10% and 11% but the variation along the two roads of Tjimalaka was 6% on the side road and 16% on the main road.

25. Work. 18% of the hillside kampongs of Tagogapoe used part of their outdoor space - usually the front - as a working area: often for drying agricultural produce (rice, cassava, etc.). This only occurred in 5% of the houses on the main roads of Tagogapoe and Tjimalaka.

26. Latrines. Outside latrines were difficult to ennumerate. It can almost be taken for granted that there were few if any inside latrines. A common device is to use a sort of moveable fenced raft

fastened to the side of a squared fish pond. In a country with the heavy rainfall of Indonesia this seems a reasonably efficient and sanitary practice provided too many people do not use the same pond.

27. As in many other countries, the most important innovations for health and convenience are in the field of public services rather than in building construction. Of these the most important for health and convenience in West Java are a piped supply of drinking water and electric light. With these can be coupled a hard surfaced access road with its own drainage ditches.

28. The provision of water borne sewage however moves into quite another realm of economy. Even an encouragement of the use of bore hole latrines can be queried in this land of copious rainfall and well drained soil. The use of open ditches is certainly unhygienic but the customary use of moveable latrines shifted around the cemented sides of small square fish tanks is perhaps worthy of further investigation as an organic and productive form of cesspit. Clearly (as with a cesspit) the size of the tank must be related to the number of its uses, as well as the type and quantity of its fish. But a good deal is already known about this among the local people and merely needs systematic recording.

29. Conclusion. From this brief analysis of the findings it would appear that house plots for small towns in West Java should be designed to fulfil the following requirements:

1. Front: Flowers or vegetables with a shade tree to one side of the house.
2. Sides: Behind the shade tree a space for fuel storage and a goat shed. On the other side a vegetable plot. In some cases, off the main roads, part of the vegetable growing area would be kept as an area of stamped earth to be used as a work site for drying agricultural produce.
3. Back: A well and a washing place not far from the cooking area of the house, which would normally be on a back verandah.

30. These are the factors which must be taken into account for each individual house plot. In addition, however, every small cluster of houses needs:

1. Some space for children to play.
2. A small "warung" or house-shop for the sale of cooked food and eggs, etc., with a bench and a shade tree where the elders can sit.
3. Some space for a small banana grove (probably at the junction of every few lots, so that the ownership of each banana stool is evident).

31. The first two items on this list would be the Indonesian equivalent of the gossip square and children's playground required by the Doxiadis Communities Class II. These items are not luxuries but basic necessities which have to be improvised if they are not allowed for in the plan.

32. It is hoped that this account of a modest investigation undertaken by the first group of Indonesian planning students may be of some interest to others who are also engaged in the problem of trying to find some of the simplest standards of measurement for a reasonable and healthy living space.

Lewis, L.J.
MOCHLABANE'S COOPERATIVE MOVEMENT
Community Development Bulletin, Vol. X, No. 4, September, 1959.
Pages 77-80

1. It has become commonplace to think of community development as a technique, developed by government or other organized agencies, for improving the way of life of groups of people and that it is achieved by stimulating them to co-operative effort within the limits of the resources available to them. RURISTICS abstracted a report on such community development in Africa published by UNESCO in the last issue, April, 1960. But here is an abstraction of an article on the community development work of a single individual.

2. Need for Action. Mr. Mochlabane is of Zulu origin, but married to a Basuto woman. He came to the conclusion that the people would be unlikely to accept the leadership of a "black-European" and decided to give up employment and those things tying him to his education and other "black-European" habits. He left Morija for Rhodhane and began trading and farming with increasing success.

3. Unfortunately, his very success embittered his neighbours, who, in various ways, destroyed his assets. He was determined to show them that he neither feared them nor was willing to give up his objective of helping them to a more satisfactory way of life. He realised that there were four possible afflictions which could befall their crops in the course of the year -- drought, frost, hailstones, borers and cut worms. At the same time he realised that a particular trait of his people in times of calamity further handicapped them. When calamity befall their crops they tended to adopt a fatalistic attitude; they would pray but do nothing more to help themselves.

4. Farming and Co-operation. His approach to the people was initially personal and individual -- visiting them in their homes, sharing their food and, eventually, having them to share his own food. He then brought them together in groups. One of the essential factors of his scheme was to work together. His solution to the four afflictions to agriculture was to plant and harvest several crops in the course of the year, thereby ensuring some safeguard against the famine which could occur if the only food crop were destroyed. He recognised the importance of the use of fertilisers, and of inter-cropping.

5. As a means of giving a sense of solidarity, Mochlabane introduced a system of certificates. At the end of a year's satisfactory participation each participant receives one up to the first five years: at the end of the sixth year a diploma is awarded. Underlying this is the idea that just one year is not enough to make people into better farmers.

6. Method of Approach. In starting a new branch Mochlabane always seeks first the support of the local chief. After he has made a satisfactory contact, he gets at least five people to agree to work his system: each person having one piece of land which they all help to prepare turn by turn co-operatively. Then, in building up his working relations with individuals and with groups, Mochlabane emphasises the importance of the personal factor. Because of this, he has begun to establish a system of branch leaders.

7. Results. Mochlabane's methods have certainly proved very successful, both in terms of bringing some of the poorer and less able members of the community into co-operative groups, and in improving the quantity of crops produced by people on their individual pieces of land. This has resulted in considerable improvement in cash returns and created a point of contact between the government Co-operative Department and a community unlikely to have responded to normal attempts at building up co-operative organisations. In this respect the government has shown insight into the possibilities of Mochlabane's work by giving assistance in the purchase and sale of crops and in providing means for the purchase of seed and fertiliser as well as participation in the more ceremonial aspect of Mochlabane's gatherings.

8. Mochlabane has exhibited a genuine appreciation of the ways of thought of his people, of their basic needs, and of the possibilities of persuading them to work together to their individual and communal advantage. He has inspired many of his people to the possibilities of better use of their land at a time when land hunger is becoming a serious problem. He has introduced a new social factor which, with encouragement, undoubtedly will contribute to the mitigation of the social ills that are a direct consequence of the migration of the men from Basuto land to the mines of the Union. He has demonstrated the strength of traditional beliefs and practices, and at the same time has given indications of how they can be successfully harnessed and modified to serve the changing circumstances. The degree to which his movement can grow and become a continuing constructive aspect of life in the Basuto villages in the immediate future will depend very much upon the extent to which it will be possible to maintain his very individual personal influence over the people, whilst at the same time establishing satisfactory machinery for the extension

and administration of the group activities; the building-up of equipments and resources; and the development of successful sales procedures. The government has shown considerable imagination and appreciation of the possibilities that lie ahead, and there is every reason to believe that from this very individual exercise in community development will grow yet another variation of successful community effort on a national scale.

Bogue, Donald J.
THE USE OF CENSUS DATA TO STUDY FACTORS AFFECTING MIGRATION
"The Use of Census Data to Study Factors Affecting Fertility, Mortality and Migration", Prepared by the Demographic Training and Research Centre, Chembur, Bombay, with the co-operation of the United Nations Bureau of Social Affairs for United Nations Seminar on Evaluation and Utilization of Population Census Data in Latin America, 30 November - 18 December 1959, Santiago Chile. Mimeographed Paper. 32 pages, pages 25-30.
325 (100).

1. This article continues part of the series published in EKISTICS from the United Nations Seminar on Population Census Data held in Santiago Chile in December of 1959. In February, EKISTICS 52, another article by Donald J. Bogue of the Demographic Training and Research Centre, Bombay, was abstracted showing methods of determining internal migration from the use of place-of-birth and duration of residence data. The present article is complementary to that, and analyzes the factors affecting migration, the measurement of such factors, and those forces which the census data cannot measure.

2. Factors Affecting Migration. It has become almost a tradition in migration research to classify migration factors into two groups, the so-called "push factors" which tend to expel persons from their former places of residence and the "pull factors" which attract them to relocate themselves at a particular site. The various types of factors which affect migration decisions may be conveniently classified in terms of this dichotomy. After enumeration of these factors, methods of expressing them in quantitative form, using census data, will be discussed. It will be discovered, of course, that some of them can and that others cannot be given quantitative expression, because censuses do or do not provide the necessary information.

A. PUSH FACTORS AFFECTING MIGRATION

(1) Economic factors

(a) Prevalence of chronic unemployment or underemployment
(b) Lower levels of living, lower income, than exist elsewhere
(c) Poor working conditions - long hours, physical discomfort, unhealthfulness

(2) Family factors

(a) Dissolution of family ties through divorce, widowhood, estrangement
(b) Desire of young persons to escape dominance of parents and family
(c) Marriage to a person whose regular place of residence is in another community

(3) Health factors

(a) Need to move elsewhere for health reasons: adverse effect of local climate and living conditions
(b) Absence, or low quality, of public health and medical facilities; prevalence of infectious diseases without preventive action

(4) Legal and political factors

(a) Civil - desire to escape restrictions placed upon the person by political action or by law, either as a general policy or because of legal action taken against persons
(b) Criminal - expulsion of the person from the community for criminal or immoral acts

(5) Racial, ethnic and religious factors

(a) Exclusion and discrimination against the person along lines of race, nationality, caste, etc.
(b) Religious intolerance

(6) Community factors

(a) Inadequacy of schools, absence of educational opportunities, beyond elementary level
(b) Absence of scarcity of cultural, artistic, creative activities
(c) Inadequacy of recreational, vocational facilities

(7) Psychological factors

(a) Dislike for present occupation; dissatisfaction with present employer
(b) Dislike for type of life in local community (village life, for example)
(c) Aspirations, ambition to achieve a higher plane of living; to accomplish a particular occupational goal

(d) Aspirations: ambitions for children; desire to provide education, "better place in life" for children.

B. PULL FACTORS AFFECTING MIGRATION

(1) Economic factors

(a) Plentiful supply of employment opportunities, expanding employment
(b) Higher wages than are paid elsewhere
(c) Good working conditions - shorter hours, better physical surroundings, greater safety and protection of workers' health
(d) Greater number of different potential employers, greater variety of employers

(2) Family factors

(a) Presence of a relative who can assist the migrant in getting adjusted
(b) Residence of parents changed to this place
(c) Residence of spouse; bethrothed

(3) Health factors

(a) Presence of specialized medical or health facilities; effective sanitation and preventive public health measures
(b) Healthful pleasant climate

(4) Legal and political factors

(a) Absence of restrictive or discriminatory legislation that would handicap the person

(5) Racial, ethnic and religious factors

(a) Presence of a large ethnic or racial colony
(b) Absence or lower intensity of racial and ethnic discrimination

(6) Community factors

(a) Availability of good schools for children
(b) Availability of good varied cultural and recreational facilities

3. Measurement of factors affecting migration. From the above listing it quickly becomes clear that push and pull are only the opposite sides of the same coin. This being the case, it is possible to develop a set of indexes of migration forces which might be thought of as being positive with respect to places of migration origin. Moreover, many of these indexes can be computed from census data, provided a rather broad set of questions has been asked in the census, and there has been an economic, housing and agricultural census, as well as a population census. Following is a list of such indexes:

a. Indexes measuring economic forces in migration

(1) Rate of unemployment
(2) Extent of part-time work
(3) Proportion of jobs requiring more than 45 hours per week without overtime pay
(4) Proportion of families receiving "poverty levels" of income
(5) Proportion of population working in jobs classed as hazardous to life or health
(6) Average wage rates in each of major types of industry
(7) Rate of change of employment
(8) Rate and type of expansion in plant and facilities
(9) Number of employers
(10) Number of employees
(11) Number of different industries
(12) Occupational composition
(13) Changes in occupational composition
(14) Industrial composition
(15) Changes in industrial composition

b. Indexes measuring health forces in migration

(1) Rating of climate for health and comfort
(2) Number of physicians per 1,000 population
(3) Number of hospital beds per 1,000 population

c. Indexes measuring racial and ethnic forces in migration

(1) Percentage of population born outside the country
(2) Percentage of population born outside the province, etc., or outside the locality of residence
(3) Percentage of population of each race or nationality
(4) Percentage of population of each religious affiliation

d. Community factors

(1) Number of teachers per 100 school-age children
(2) Expenditure on education per 100 pupils
(3) Presence and capacity of secondary schools, universities

4. Migration forces which census data cannot measure. It is readily apparent that there are several items in the push and pull category that cannot be adequately represented by indexes computed even from detailed census data. Quantitative indexes could be devised for each of these missing items, but only if a special survey were taken to obtain the necessary raw data. The following is a list of important migration forces which cannot be quantified with census data:

a. Extent of underemployment
b. Extent of job dissatisfaction
c. Objective rating of actual present level of living
d. Extent of dissatisfaction with present level of living
e. Extent of dissatisfaction with political regime or legal restrictions in place of residence
f. Desire of younger persons to live away from their family, to be independent
g. Frequency of marriage to persons from other communties and the amount of migration caused thereby
h. Effect of family dissolution upon migration
i. Prevalence and severity of residential maladjustment for health reasons
j. Intensity of racial, caste or religious discrimination
k. Level of resentment of and desire to escape from racial or caste discrimination
l. Level of liking and disliking for life in community of childhood or present residence
m. Aspiration for a higher level of living
n. Aspiration for the future of one's children; desire for better occupation, higher education, marriage into higher classes
o. Role which relatives, families, play in determining change of residence.

5. It should also be pointed out that the analysis of census data is a necessary first step which should be followed by special inquiries for still another reason. The use of census data is a mass or aggregate approach to the problem. If one wishes to study how the forces of migration work in combination with each other, it is necessary to

quantify all of these indexes (both the census list and the special survey list) for a sample of actual migrants and non-migrants and study these indexes as potential causes in arriving at the decision to migrate.

6. Conclusion. A great deal can be done to comprehend the migration process by exhaustively studying the available census materials. This is a most important topic in population research, and should be undertaken as quickly as possible. As the resources of the census data are exhausted, thought should be given to designing special sample surveys that would refine and extend the knowledge thus obtained.

Vera, Luis

THE DIVISION OF REGIONAL DEVELOPMENT FOR LATIN AMERICA

1. In view of the twentyfifth meeting of the International Federation for Housing and Planning in Puerto Rico during the month of issue of this number of Ekistics, we publish the major part of an article by the chief of the new Division of Regional Development which has been set up with the Organization of American States.

2. Latin America is in the midst of great social, political and economic changes which for most of its 180 million people signify a greater heaval than heretofore. In many of its aspects, what is happening in Latin America can be fundamentally considered as a revolution. The transformation is of such vast proportions that its dimensions cannot be easily grasped by those who are not experiencing it.

3. Latin America is not rising exclusively on the foundations of its pre-Columbian civilizations, or on its colonial heritage, or on its past struggles for independence, but it is striving for a better future carrying the burden of its entire past. At the same time that an entirely new and modern capital city - Brasilia - is rising in the middle of an area surrounded by vast jungles, thousands of primitive shacks appear overnight at the periphery of the larger cities. Few areas in the world present such acute contrasts as Latin America: the beast of burden and the jet airplane, implements of stone and stainless steel, dung used as fuel and thermonuclear power, illiteracy and advanced intellectualism, profound religious feelings and atheism, all coexist side by side.

4. <u>Development, a misleading simplification</u>. The concept of "development" is equivocal, for the related notions of what constitutes a "developed" or an "underdeveloped" area cannot be defined in absolute terms. "Development", as a concept applied to the solutions of human needs, is a relative term. On the one hand we are dealing with the different rates of change between certain segments of the socio-economic complex in any given society, e.g. urban vs. rural growth, and on the other with what a particular society feels their needs are. "Development", then, is a question pertaining to the degree of balance between segments of a society's socio-economic structure, the differential between them and the aspirations of the group.

5. In modern times, particularly after World War II, "development" has been measured in terms of the differences that exist between "heavily industrialized" and "less industrialized" countries; a difference brought about by fast changes in the machine technology of a few nations. These nations have not only set up their own technological standards as a measuring stick vis-a-vis the rest of the world, but the so-called "underdeveloped" countries have adopted this to guide their own aspirations. However, one of the characteristics in many of the "underdeveloped" areas of the world, is the great distance between the leading urban technocracy, which adopts this type of change as its goal, and the great masses of the population: a phenomenon which contributes to still greater socio-economic unbalance.

6. Latin America as a whole can be considered as one of the areas within Western civilization where technology did not change as fast as it did in Western Europe and the United States. This situation is similar to that which obtains between urban and rural areas in any one Latin American country today. The Latin American technocracy is trying to "catch-up" with its West European and American cultural relatives; the Latin American villager, is trying to emulate his urban cousin. It is, however, beginning to be apparent, in the minds of more and more leading Latin Americans, that the fulfillment of their aspirations for a more "developed" machine technology society requires integral socio-economic planning to check the progressively more accentuated unbalance between segments of their population.

7. Problems of growth. An unbalanced type of change inevitably results in great strains and stresses which affect the whole of the social structure as it becomes violently uprooted from the past and forcibly thrust into the future.

8. The transition which must take place has to overcome tremendous odds. Let us enumerate some of the major problems:

a. Population is growing at the rate of 2.5 per cent a year. This demographic explosion, which will give Latin America 300 million inhabitants by 1975, requires a fast rate of economic growth.

b. Sixty per cent of the population in Latin America is illiterate. The money being spent to raise the level of education in all twenty countries is less than 600 million dollars a year, while military expenses total more than 1200 million dollars a year.

c. Three-fourths of the population derive their income from a type of agriculture which, due to the inadequate level of technology, cannot cope with the rate of urbanization and population growth. As a consequence of this phenomenon 90 million Latin Americans live in a chronic state of hunger.

d. The lack of balance between urban and rural areas implied above, manifests itself in the existence of 65 metropolitan centers, where 42 million people live with a relatively high standard of living in comparison with the 24 million people who inhabit small towns and the 114 millions that live in the more rural areas. The two latter categories (138 million people) live partially outside of the economic and social changes operating in the cities: changes that nontheless affect them but over which they have no control.

e. Savings, and therefore capital formation, proceed at too slow a rate to be able to finance the expansion required to achieve an adequate industrial and agricultural development.

f. The Latin American countries are economically dependent on one or two commodities which they export. Coffee and petroleum represent more than half such exports. Furthermore, they lack the skilled labor needed for the diversification and strengthening of their economies.

g. Most Latin American countries do not have the kind of efficient public administration required for putting into effect development programs.

h. Lack of economic resources, and inadequate public administration, as well as lack of understanding of the integral nature of the national socio-economic phenomenon, have led to development programs being carried out on the basis of unilateral projects, which do not take into account the real needs and tendencies of the population.

9. The obstacles listed above are formidable indeed. They are not, however, insurmountable since Latin America possesses the prerequisites for a rapid socio-economic expansion.

a. Latin America has the natural resources with which to build a well-structured industrial society - water-power, coal, minerals, and oil.

b. It has the land, the climate and other resources to cope with more than just its own food requirements.

c. It can count on growing numbers of experienced Latin American technicians, as well as on a fast developing leadership which is becoming increasingly aware of the need for total socio-economic development.

d. Finally, it has a human potential that can easily transform itself into a great reservoir of skilled labor.

10. In the past, with very few exceptions, European, American and Latin American planners who have worked in Latin America have not faced the problem in its total context. At the regional level, they have not aimed at developing resources in a comprehensive manner, nor have they directed growth accordingly. At the urban level, they have drawn blueprints which, once produced, were already obsolete vis-a-vis the growth of cities. Consequently, their recommendations have been, at best, stop-gap solutions which in no way respond to the real causes of excessive urban growth in Latin America.

11. Development and the Organization of American States. In the face of such problems of development, it is fitting to consider the role of the Organization of American States (OAS) as an international body whose aims are essentially those of preserving the peace and promoting the welfare of its member nations.

12. The OAS was born in 1890 out of the First International Conference of American States. Through the Inter-American Economic and Social Council (I-A ECOSOC), one of its permanent international organisms created in 1948, it has aired the problems which retard the socio-economic development of Latin America and I-A ECOSOC is presently carrying out "Operation Pan-America", the most comprehensive and dynamic program it has yet devised to enable the Latin American nations to cooperate in the solution of their development problems.

13. The fulfillment of the resolutions of "Operation Pan-America" has been entrusted to the Department of Economic and Social Affairs of the Pan American Union (headquarters in Washington) in its capacity as the Executive Secretariat to the I-A ECOSOC. This Department is therefore conducting a study of the economies and resources of ten Latin American countries, as well as some more specific studies such as agrarian reform, transportation, social security, and common markets.

14. The problems of Latin American physical growth are being studied in two Divisions of this Department, namely, the Inter-American Housing Center (CINVA) and the Division of Regional Development. CINVA was established in Bogota, Colombia, in 1951, and provides post-graduate level education and training for professionals from all the member nations of the OAS who desire to specialize in the technological, economic, social and administrative aspects of housing. The Division of Regional Development was created in 1959 and carries out its activities from Washington. This Division is in charge of the urban and regional planning programs and the programs of community development of the OAS. It operates through basic research, and through technical assistance, planning education and documentation programs.

15. The Department of Economic and Social Affairs visualizes problems of development in their total objective complexity, and therefore aims at the balanced integration of their social, economic and physical aspects. This operational concept implies that research projects and development programs are based on interdisciplinary work which, if not a theoretical novelty, represents a significant shift from the customary practice of separating the social, economic and physical aspects of development and treating each independently from the others. "Social development" has often meant a rhetorical type of social justice, as it has not been considered in the light of both the economic and physical aspects of development. In turn, "physical growth" has not infrequently been relegated into a marginal type of activity because of an aloofness with respect to its social and economic components. And "economic development", operating only in terms of abstract economic concepts, has often remained in an academic vacuum.

16. <u>The Division of Regional Development</u>. Recognizing the valicity of the interrelation of social, economic and physical problems of development, this Division was created in order to study such interrelationships as they obtain in Latin America, and to indicate the solutions needed for the better utilization of the physical, technological, social and economic resources in this area through specific programs of urban and regional development. The Division therefore has been charged with three major areas of study: location, urban growth, and regional development programs.

17. <u>Location</u>. As is well known, the socio-economic phenomenon is reflected in the way that man transforms his natural environment. The new physical structures which result have to do with the aspects

of location, of production, and consumption. The Division is therefore interested in determining the location of agricultural and industrial production as well as the location of markets and settlements of a region, in order to achieve a comprehensive analysis of land use.

18. It appears, then, that in a breakdown for such an analysis the Division has to consider, both from the regional and the urban points of view, the components of land economics. Within a physical framework, the problems of location involved in the urban and rural habitats also have to be analyzed. It is not possible to separate the physical content from the socio-economic framework because they both integrate man's total environment. The socio-economic structures, therefore, have to be analyzed in order to establish the interrelationships that ensue.

19. Urban growth. The urban aspects of location need to be treated in its dynamics. The Division of Regional Development is therefore vitally interested in studying the phenomenon of urban growth in Latin America. A consequence of overall change, urban growth in this part of the world cannot be treated in isolation but has to be seen in its total rural-urban context.

20. Within the framework it is important to determine the strategic position of cities in the socio-economic dynamics of regions and countries. The particular direction of overall change in Latin America indicates the extraordinary importance of urban areas as the focal points of change. The impact of urban growth has, as one of its major consequences, the breakdown of the socio-economic balance between rural and urban areas, and therefore a greater speed-up in the dynamics of the latter with respect to the former. This manifests itself in the physical growth of a few urban and metropolitan centers and in the attraction which these exercise over the rural people.

21. Regional Development Programs. The type of interdisciplinary basic research implied in the study of locations and urban growth, which takes into consideration the social, economic and physical components of a region or country, their dynamics, and the multiple interrelations between them, yields the raw data from which realistic programs and policies can be formulated. Two major consequences arise out of this approach: (a) problems are seen in their context, and (b) action appears as a matter of development of regions or countries.

22. Physical growth must be undertaken by tackling the problems of transportation and communications, power and hydraulics, new sources of energy, community facilities, public utilities, new towns and site planning, all in their mutual interrelationships and in their national, regional or local context.

23. Social growth implies the solution of problems which have to do with the rural-urban unbalance. First and foremost there is the problem of integration of populations. In some Latin American countries, great masses of Indians must be brought into the complexities of Western civilization. In others, vast numbers of peasants must be brought into a greater socio-economic harmony with Latin American urban life. In both cases this means the utilization of a tremendous human reservoir through planned community development which must, of necessity, include not only the acquisition of various skills and the improvement of health and housing standards, but also the extension of urban community facilities and services into rural areas, and the creation of job opportunities through the dispersion of industrial plants throughout the region as a whole. To do one without the other can only contribute to the deterioration of the situation in rural areas as new aspirations are thereby created in them which cannot be met realistically in the already congested metropolitan areas.

24. Physical and social growth, as conceived above, implies economic growth. The creation of the skills needed for the utilization of resources and new technologies give the people of a region or a country the capability to develop its economic base. To think of economic development in isolation from the social and physical aspects of the whole, and therefore in terms of only an increase of per capita income, is tantamount to creating new bottlenecks in the total dynamics of a population.

25. In the light of the concepts previously discussed, it is clear that regional development can only be effected through integrated regional planning, and the studies being carried out by the Division of Regional Development, by providing the bases for regional development programs, can be useful in the formulation of regional development policies in Latin America.

26. <u>The Division's first year of operation</u>. The orientation which has been described as an integrated approach to development problems has guided the activities of the Division of Regional Development since

its inception. These activities fall into the five categories of basic research, applied research, technical assistance, technical education, and documentation.

27. In the fields of interdisciplinary basic and applied research, the Division is presently engaged in projects aimed at analyzing Latin American socio-economic structures and their dynamics in relation to urbanization, agrarian reform and economic development; at an evaluation of techniques of community development, including the cooperative experience, in relation to regional development; at the problems of directed change; and, finally, at the location of industries and at the integrated development of river basins.

28. Concerning technical assistance, the Division of Regional Development, during its first year of existence, has been entrusted with projects among which we shall mention the following: assistance to the Planning Office of the District of Bogota, Colombia, in the preparation of a master plan for this metropolitan area; assistance to the National Coordinating and Planning Commission of Bolivia in the adoption of a national planning law, as well as assistance to the Planning Office of the Municipality of La Paz in the preparation of a master plan for this city, and to the University of San Andrés, La Paz, in the creation of a graduate program in planning education; assistance to the National University of Engineering of Peru in the drawing up of a new curriculum for its Planning Institute; assistance to the Municipality of Bahia Blanca, Argentina, in the study of this city and its metropolitan region as a preliminary step for the preparation of a master plan; assistance to the national government of Uruguay in the renewal of this country's highway system in relation to economic regions; and assistance to the National Development Commission of Cuba in the study of economic regions.

29. The Division of Regional Development is at this time engaged in a project of enquiry into the present status of planning education programs in Latin America as a whole. The results of this study will be published during the current year. Furthermore, the Division, in collaboration with the United Nations, has finished, at the request of the Peruvian Government, a preliminary study aimed at strengthening the existing planning education curriculum and facilities of the Institute of Planning of the National University of Engineering in order better to serve the needs of that country as well as those of other Latin American nations.

30. Finally, the concepts of basic research, technical assistance and planning education for total development are being integrated in an inter-divisional effort by the Department of Economic and Social Affairs. This activity has made possible through "Operation Pan-America" at the request of the Peruvian Government, a project directed to integrating the social, economic and physical resources of Peru. A representative study area has been chosen in that country for the analysis of physical, social, economic and institutional structures in order to lay the foundations for integral development plans.

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